Sandia National Laboratories/New Mexico

PROPOSALS FOR NO FURTHER ACTION ENVIRONMENTAL RESTORATION PROJECT SWMUs 2, 30, 94B, and 94F

Volume 3 of 3
(SWMU 2)

September 2001

Environmental
Restoration
Project

United States Department of Energy
Albuquerque Operations Office

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CHAPTER 5.0
ACRONYMS AND ABBREVIATIONS

ACF	American Car & Foundry
AOP	Administrative Operating Procedure
bgs	below ground surface
CEARP	Comprehensive Environmental Assessment and Response Program
COC	constituent of concern
CWLF	Classified Waste Landfill
DOE	U.S. Department of Energy
DTR	Delivery to Reclamation
EM	electromagnetic
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
g	gram(s)
GEL	General Engineering Laboratories, Inc.
HE	high explosive
HI	hazard index
HRS	Hazard Ranking System
KAFB	Kirtland Air Force Base
kg	kilogram(s)
L	liter(s)
LAGS	Large Area Gamma Spectroscopy
LSC	liquid scintillation counting
MDA	minimum detectable activity
MDL	method detection limit
µg	microgram(s)
mg	milligram(s)
mrem	millirem(s)
MS	matrix spike
MSD	matrix spike duplicate
ND	nondetect
NFA	no further action
NMED	New Mexico Environment Department
NMMSS	Nuclear Materials Management and Safeguard System
PCB	polychlorinated biphenyl
pCi	picocurie(s)
PID	photoionization detector
PRG	preliminary remediation goal
QA	quality assurance
QC	quality control
RCRA	Resource Conservation and Recovery Act
RPD	relative percent difference
RPO	Radiation Protection Operations
RPSD	Radiation Protection Sample Diagnostics
SAP	Sampling and Analysis Plan
SNL/NM	Sandia National Laboratories/New Mexico
SVOC	semivolatile organic compound
SVS	soil-vapor survey
SWMU	Solid Waste Management Unit

TA	Technical Area
TEDE	total effective dose equivalent
VCM	Voluntary Corrective Measure
VOC	volatile organic compound
W-Pit	Western Pit
XRF	X-ray fluorescence
yr	year(s)

5.0 SOLID WASTE MANAGEMENT UNIT 2, CLASSIFIED WASTE LANDFILL

5.1 Summary

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a risk-based no further action (NFA) decision for Solid Waste Management Unit (SWMU) 2, the Classified Waste Landfill (CWLF), Operable Unit 1303. SWMU 2, the Technical Area (TA)-II CWLF, is an inactive site located on the eastern side of TA-II. Environmental concern for SWMU 2 was primarily based on the potential for the presence of hazardous and radioactive materials. Review and analysis of all relevant data for SWMU 2 indicate that concentrations of constituents of concern (COCs) at this site are less than applicable risk assessment action levels. Thus, SWMU 2 is proposed for an NFA decision based upon a Voluntary Corrective Measure (VCM) that excavated the entire landfill and removed the buried materials. The VCM was conducted from March 1998 to February 2000. Backfilling the excavation with the excavated soil is currently planned for July 2002. Subsequent confirmatory soil sampling data demonstrates that COCs that may have been released into the environment pose an acceptable level of risk. The risk is based upon the current and projected land use, as set forth by Criterion 5. Criterion 5 states, "The SWMU/AOC [area of concern] has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

As this NFA proposal was being prepared, additional sampling of the excavated soil was conducted at the request of the New Mexico Environment Department (NMED) to further justify the intent to use this soil as backfill. In concurrence with NMED, a Sampling and Analysis Plan (SAP) (SNL/NM January 2001) was prepared in June 2001 to sample the excavated soil piles for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), polychlorinated biphenyls (PCBs), tritium, and gross alpha/beta. During the excavation, screening, and movement processes, the soil lots were segregated and staged as nine "potentially uncontaminated" and 22 "potentially contaminated" soil piles.

PCBs, almost exclusively Aroclor 1254, were detected in all 22 of the potentially contaminated soil piles and at lower concentrations in five of the nine potentially uncontaminated soil piles that were sampled for PCBs. Seven samples from the potentially contaminated soil piles had PCB concentrations above 1 milligram (mg)/kilogram (kg). The maximum concentration measured was 5.56 mg/kg. PCB concentrations in the potentially uncontaminated soil pile samples ranged from 0.0024 mg/kg to 0.827 mg/kg, but these piles were not sufficiently sampled for PCBs to define the extent of contamination.

The NFA text and risk assessment were not updated to include these new findings. In September 2001, in consultation with the U.S. Environmental Protection Agency (EPA), a Notification of Self-Implementing Clean-Up and Disposal of Polychlorinated Biphenyls at SWMU 2 was initiated according to 40 Code of Federal Regulations 761.61(c). Following the required characterization, the additional data, a revised human health risk assessment, and any revisions the to soil pile disposition strategy will be submitted as an addendum to this NFA.

5.2 Site Description and Operational History

5.2.1 Site Description

TA-II, one of five TAs within SNL/NM (Figure 5.2.1-1), is a diamond-shaped area, approximately 45 acres in size (Figure 5.2.1-2). In 2001, TA-II was still surrounded by the 10-foot high chain link security fence, with the main access gate at the western corner of the diamond.

SWMU 2 is located in the eastern portion of TA-II (Figure 5.2.1-2). The landfill proper covers approximately 1.5 acres. The site is on land owned by Kirtland Air Force Base (KAFB) and permitted to the U.S. Department of Energy (DOE). SWMU 2 is situated immediately west of the rim of Tijeras Arroyo and the nearly flat floodplain below (Figure 5.2.1-3). Tijeras Arroyo is the most significant surface-water drainage feature on KAFB. The arroyo originates in the Tijeras Canyon, which is bounded by the Sandia Mountains to the north and the Manzano Mountains to the south. The arroyo trends southwest along the eastern edge of the site and eventually drains into the Rio Grande, approximately nine miles west of SWMU 2. The arroyo flows about a dozen times per year along the active channel that is located approximately 1,400 feet southeast of the site.

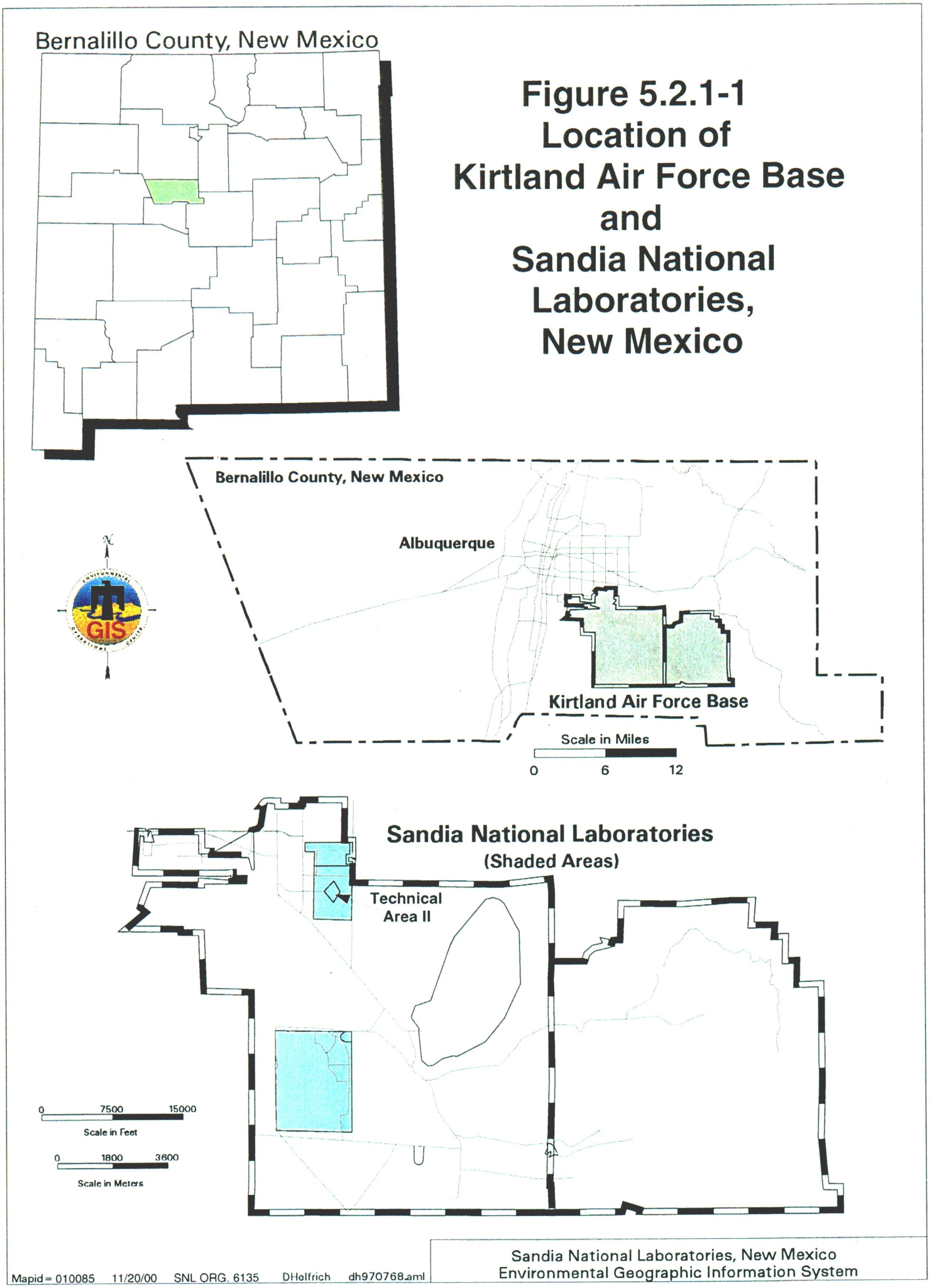
The annual precipitation for the area is 8.1 inches (NOAA 1990). No springs or perennial surface-water bodies are located within four miles of the site. During most rainfall events, rainfall quickly infiltrates the soil at SWMU 2. However, virtually all of the moisture undergoes evapotranspiration. Evapotranspiration estimates for the KAFB area range from 95 to 99 percent of the annual rainfall (Thompson and Smith 1985, SNL/NM February 1998a).

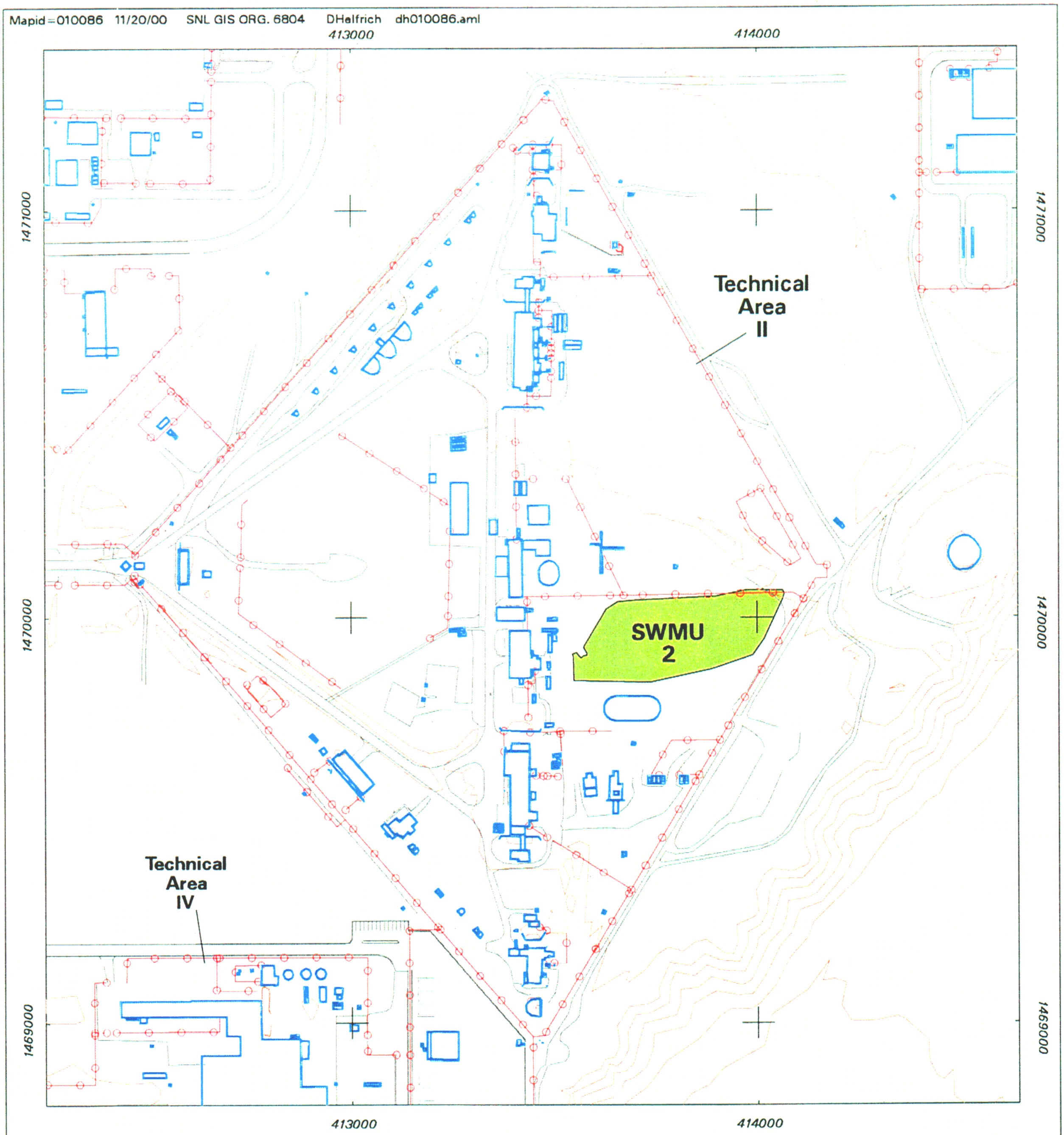
TA-II is outside the 100- and 500-year floodplains of the Tijeras Arroyo. In response to precipitation events, surface-water run-off occurs by natural flow paths. TA-II never had any storm drain system, either open channels or buried piping. Surface runoff eventually discharges into Tijeras Arroyo south of TA-II.

TA-II lies at the southeastern boundary of the East Mesa, on a broad pediment that gently slopes west toward the Rio Grande. Surface drainage across the East Mesa follows the pediment slope westward toward the Rio Grande. Surficial deposits are underlain by the upper unit of the Santa Fe Group. Hawley and Haase (1992) estimate that in this area, the piedmont-slope alluvium may be up to 100 feet thick, and the upper Santa Fe unit is approximately 1,200 feet thick. The topography at TA-II is nearly flat with elevations ranging from 5,420 feet at the northeastern boundary to about 5,410 feet at the southwestern boundary.

The regional aquifer in the vicinity of SWMU 2 is within the upper unit of the Santa Fe Group. The depth to regional groundwater in the monitor well nearest to SWMU 2 (TA2-NW1-595) is approximately 520 feet below ground surface (bgs). A shallow water-bearing zone also exists in the vicinity of SWMU 2. The depth to the shallow zone in the vicinity of SWMU 2 ranges from approximately 267 to 320 feet bgs. Nearby monitor wells TA2-SW1-320, TA2-NW1-325, TA2-W-19, TA1-W-03, TA1-W-06, TA1-W-07, and TA2-W-01 are screened in the shallow water-bearing zone. The regional wells are: TA2-NM1-595, TA2-W-24, TA2-W-25, TJA-3, TJA-6, TA1-W-04, and TA1-W-05.

Soil along the northern rim of Tijeras Arroyo is poorly developed, such as the Bluepoint-Kokan Soil Association (Hacker 1977). Areas underlain by this soil series, however, locally contain


Bernalillo County, New Mexico
Figure 5.2.1-1
Location of
Kirtland Air Force Base
and
Sandia National
Laboratories,
New Mexico
Bernalillo County, New Mexico
Albuquerque
GIS
Kirtland Air Force Base
Scale in Miles
0
6
12
Sandia National Laboratories
(Shaded Areas)
Technical
Area II
0
7500
15000
Scale in Feet
0
1800
3600
Scale in Meters
Mapid = 010085 11/20/00 SNL ORG. 6135 DHelfrich dh970768.aml
Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Legend

Road
Fence
10 Foot Contour
Building / Structure
SWMU 2

Figure 5.2.1-2
Location of SWMU 2,
Classified Waste Landfill
within TA-II

0 200 400
Scale in Feet

0 48 96
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.2.1-3
SWMU 2 and Tijeras Arroyo, looking north

well-developed calcic horizons, which are the remnants of the Tijeras, Wink, and Madurez soils originally developed on older surficial deposits. The Bluepoint-Kokan soil reflects erosion of older soil and, therefore, is characterized by discontinuous soil horizons. Soil along the northern rim of Tijeras Arroyo and TA-II has been defined as the North Supergroup (IT March 1996)

5.2.2 Operational History

TA-II was a high security area for many years, initially used for weapons assembly in the late 1940s and early 1950s, then dedicated to explosives research until the mid-1990s. The security and proximity to other SNL/NM facilities led to the area being selected for the disposal of classified material. Classified material was buried at SWMU 2 reportedly from the early 1950s through 1987, but disposals might have started as early as 1947. The last disposal at SWMU 2 occurred in October 1987. Between 1978 and 1987, all waste material was reportedly screened for radioactive and chemical contamination prior to disposal in SWMU 2 (SNL/NM August 1991).

Process knowledge for SWMU 2 was compiled from interview notes, Delivery to Reclamation (DTR) records (SNL/NM October 1987), a Burial Log Book (SNL/NM February 1991), and the Nuclear Materials Management and Safeguard System database (ORNL 1995). While the available records contained some specific details of the landfill contents, much of it was quite general and did not provide very accurate locations of the burials or information on hazards associated with the materials. The landfill contained classified material that, by shape or content, contained information important to national security. The majority of classified material disposed in SWMU 2 consisted of weapons-related components of metal, plastic, foam, and electronics that no longer had any practical use. The material was collected around SNL/NM and stockpiled in a vault until there was sufficient material to warrant a disposal. Until 1958, no records were maintained for material disposed in SWMU 2 (SNL/NM August 1991). An inventory of the classified material buried prior to June 1972 reportedly was destroyed during file purging conducted pursuant to a DOE paperwork reduction initiative in the 1980s. The surviving records are of limited use. For example, the burial logbook of the classified material disposed from June 1972 through October 1987 describes the contents of Row 3, Pit 10, and Rows A through E (SNL/NM February 1991). This inventory was of limited assistance in identifying specific COCs or hazards associated with buried materials, since it lists only general items (one rocket, one red hopper, one box lead, etc.) (CDM April 1992). Additional information was found in the DTR forms (SNL/NM October 1987), which correspond to the burial logbook and list individual items disposed of in the landfill during the 1970s and 1980s.

Two types of disposal methods were used at SWMU 2. In a few cases, discrete pits were dug for the disposal of classified material. Between May 1960 and April 1963, material from the South Albuquerque Works Plant (a former American Car & Foundry [ACF] weapons plant established in 1952) was reportedly buried at five locations north and southeast of the landfill. The ACF facility manufactured weapon handling equipment and casing components for weapons (Furman 1990). Sandia Plant Engineering drawing number 755565, dated August 1959 and revised through 1964, shows the approximate locations of four pits and one cut-and-cover trench in the eastern portion of TA-II. The ACF Pits were reportedly about 6 feet in diameter and 30 feet deep; the ACF trench was reportedly about 12 feet long by 6 feet wide by 10 feet deep. Excavation of the pits proved them to be much shallower than originally believed; the pits were only 15 to 18 feet deep. No evidence of the cut-and-cover trench, from trenching activities centering around anomalies identified through aerial photographs or geophysical surveys, was ever identified. The South Albuquerque Works Plant did not handle radioactive materials and disposed of its chemical waste at Kirtland Landfill 2, so it was assumed that the material in the ACF Pits was neither radioactive nor hazardous, but was classified.

The primary disposal method at the SWMU 2 was in open trenches. The trenches were cut in an east-west orientation using bulldozers or similar equipment (Figure 5.2.2-1). The trenches were approximately 8 to 12 feet deep, and stopped at a layer of caliche (hardened calcium carbonate). The individual trenches were approximately 8 to 12 feet wide and varied in length from approximately 100 to 300 feet. None of the trenches was lined or contained any type of leachate barriers or monitoring devices.

Once sufficient material was collected to warrant a disposal, it was transported to SWMU 2. Material was dumped in the open trench then backfilled with the soil excavated from the trench, creating a series of discrete cells within each trench. Steel pipes with location references were placed at the end of each disposal cell after it was covered (Figure 5.2.2-2). It is apparent from observations made during the VCM excavation that burial methods varied greatly during the early years of landfill operation, since the amount of soil cover over the materials in each trench varied from 1 to 4 feet. Prior to the VCM excavation, some items were visible through thin soil cover in some areas of the landfill. Later burials, primarily in the trench along the northern edge of the landfill, consistently exhibited soil cover of at least 6 feet. SWMU 2 was not used for material disposal after 1987 when classified SNL/NM material was sent to the TA-III Classified Landfill.

Based upon the historical records and on geophysical surveys, eight disposal trenches existed at SWMU 2 (Rows 1, 2, 3, A, B, C, D, and E). Prior to 1972, the burials in SWMU 2 were designated as 1, 2, and 3. The last pit in Trench 3 (Pit 10) was filled in June 1972. From 1972 to 1987, the trenches were designated with letters (A through E) (SNL/NM February 1991, CDM April 1992). The final disposal of materials at the CWLF was placed in Pit 7 of Trench E (the northernmost trench) in October 1987 (SNL/NM February 1991). Figure 5.6.2-2 shows the trench and pit locations based upon records searches, surface markers, and geophysical surveys as discussed in Section 5.6.2.

Based upon historical records and personnel interviews, the potential COCs expected in SWMU 2 included:

- Radioisotopes: plutonium, uranium, strontium, tritium, thorium, and nickel;
- Metals, primarily lead and beryllium, and possibly barium, cadmium, chromium, and mercury;
- PCBs;
- High explosive (HE) compounds; and
- VOCs.

During excavation of the landfill, the presence of elevated metal concentrations and some radionuclides was confirmed. No VOCs, HE, or PCBs were indicated or suspected during the soil characterization phase of the project, nor were they found in loose form. COCs identified during the excavation are discussed in greater detail in Section 5.6.

Figure 5.2.2-1
Aerial View of Partially Backfilled Trench at SWMU 2,
Classified Waste Landfill

Figure 5.2.2-2
View to west across SWMU 2 prior to the VCM showing steel pipe steel markers for disposal cell and trench locations

As mentioned in Section 5.0, recent sampling of the excavated soil confirmed the presence of PCBs. Additional characterization is being conducted and the results will be presented in an addendum to this NFA proposal.

5.3 Land Use

5.3.1 Current

SWMU 2 is located on federally-owned land managed by the DOE within the boundaries of KAFB. The current land use is industrial (Figure 5.3.1-1).

5.3.2 Future

The projected land use for SWMU 2 is industrial (DOE and USAF March 1996). According to the SNL/NM 10-year Master Plan, no roads or buildings are planned for the vicinity of SWMU 2 (SNL/NM January 2001). The TA-II buildings and infrastructure are obsolete and are being demolished on a staggered schedule.

5.4 Investigatory Activities

5.4.1 Summary

SWMU 2 was identified during the investigation conducted under the DOE Comprehensive Environmental Assessment and Response Program (CEARP) (DOE September 1987). In 1991, the SNL/NM Environmental Restoration (ER) Project began preliminary investigations at TA-II that included: background information reviews, personnel interviews, surface-radiation surveys, soil-vapor surveys, borehole sampling, and geophysical surveys. These investigations are discussed below.

5.4.2 CEARP Investigation

5.4.2.1 CEARP Sample Data Collection

No soil sampling activities were performed at SWMU 2 as part of the CEARP.

5.4.2.2 CEARP Data Gaps

A lack of information regarding potential hazards in the landfill prevented calculating the Hazard Ranking System (HRS) and Modified HRS migration mode scores.

5.4.2.3 CEARP Results and Conclusions

The CEARP finding was "uncertain" for Federal Facility Site Discovery and identification findings, preliminary assessment, and preliminary site inspection (DOE September 1987).

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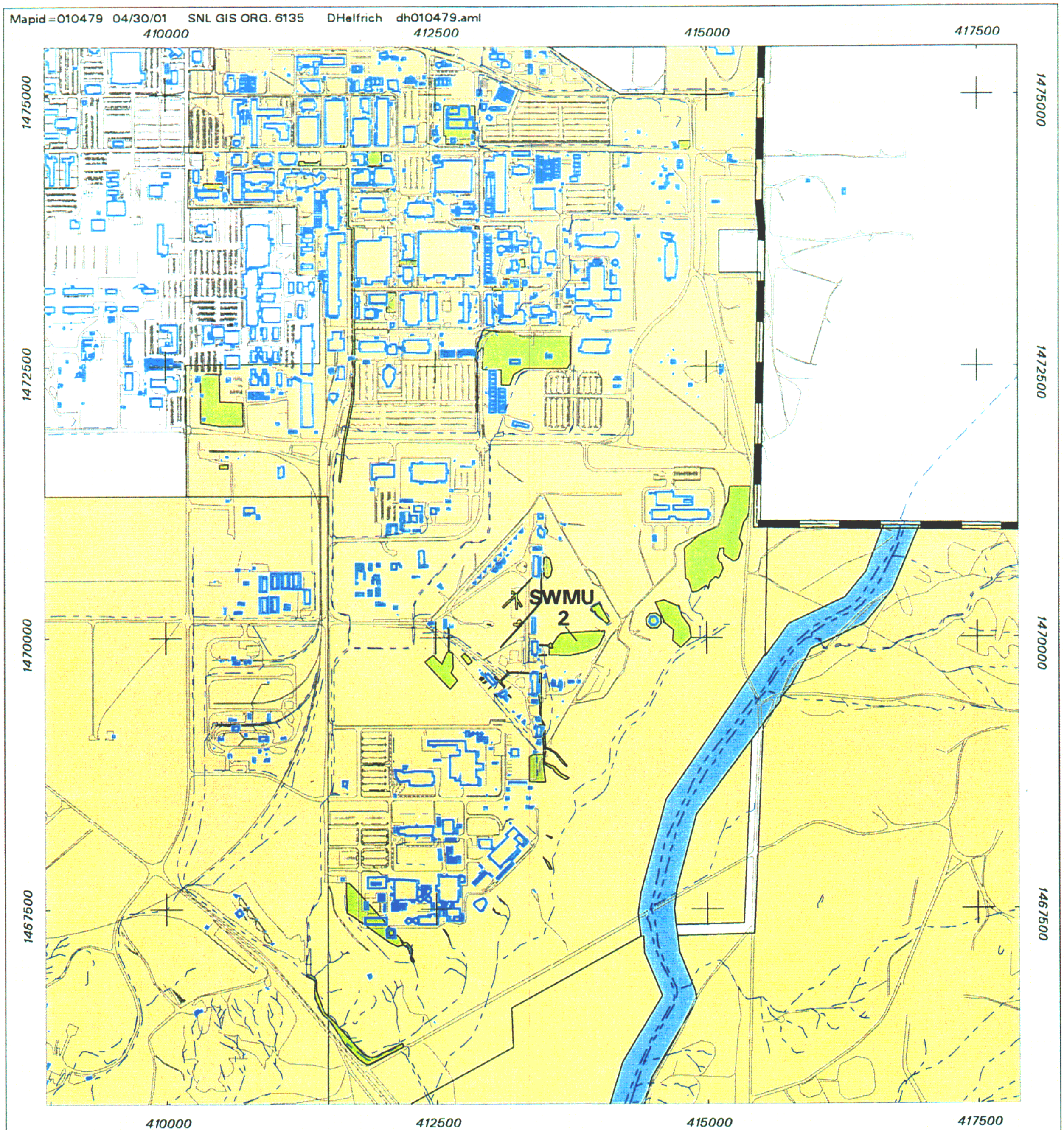

Legend

- Road
- KAFB Boundary
- Surface Drainage
- Building / Structure
- SWMU
- Industrial Land Use
- Recreational Land Use

Figure 5.3.1-1
SWMU 2: Classified Waste Landfill and Associated Land Uses within KAFB Boundary

0 750 1500
Scale in Feet

0 180 360
Scale in Meters

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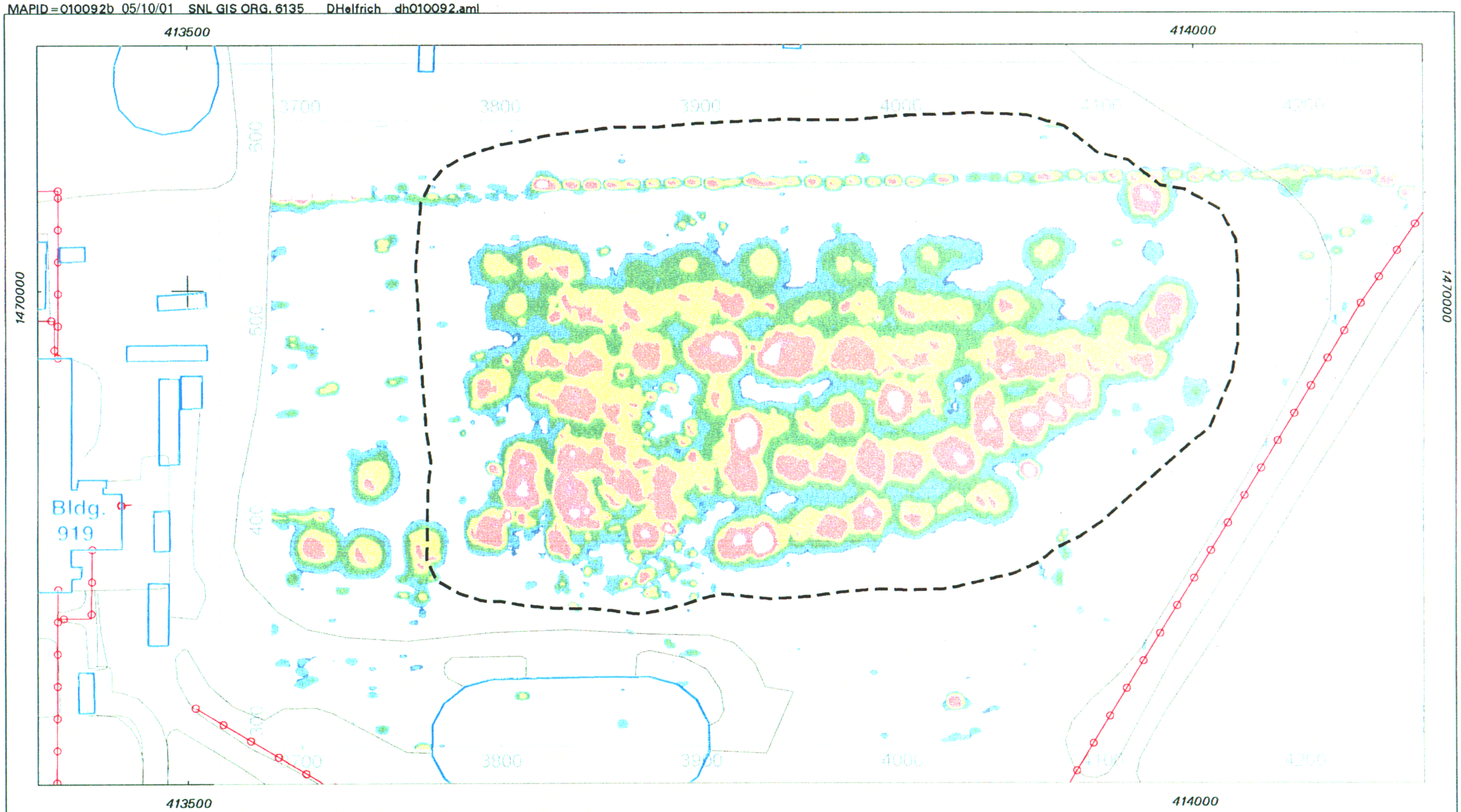
Environmental Geographic Information System



Legend

Unpaved Road / Parking

Fence

Building / Structure

Excavation Limit

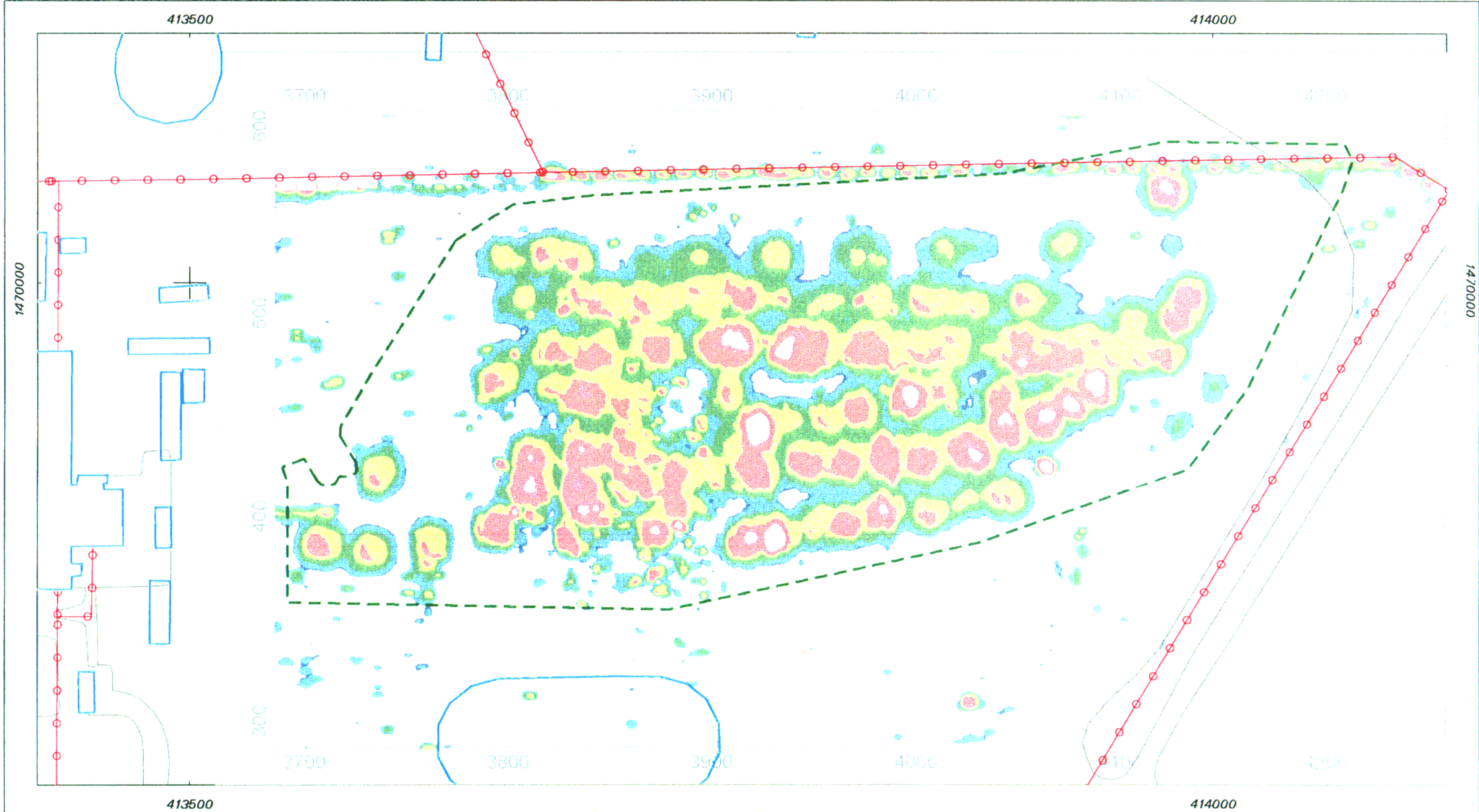
0 40 80
Scale in Feet

0 9.6 19.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.4.3.6-1
Pre-VCM Excavation
Electromagnetic (EM-61) Survey
of SWMU 2, September 1997

MAPID=010521 01/19/01 SNL GIS ORG. 6135 DHelfrich dh010521.aml



Legend

Unpaved Road / Parking
Fence
Building / Structure
SWMU 2 Boundary

0 40 80
Scale in Feet

0 9.6 19.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.4.3.6-2
SWMU 2 Boundary Established Using the Burial Pits and Trenches Located with Geophysics

5.4.3 SNL/NM ER Project Preliminary Investigations

5.4.3.1 Background Review

Current and former SNL/NM employees were interviewed in 1991 and 1992 (SNL/NM August 1991; 1992) to obtain information on the disposal methods. The 1991 archive search results were previously presented in Section 5.2.2.

5.4.3.2 Aerial Photographs

Historic aerial photographs taken on 26 dates from 1951 through 1992, were examined for evidence of burials in the landfill (Ebert and Associates, Inc. June 1994). The numerous trenches and pits evident in the photographs generally correspond with disposal locations confirmed by identification posts and later geophysical surveys.

5.4.3.3 Radiological Surveys

In early 1988, the DOE Headquarters Environmental Survey (DOE January 1989) conducted a field reconnaissance at the SWMU 2. Radiation measurements were recorded at 10-foot intervals in an east-west direction. No gamma radiation was measured above background levels during this survey.

In July 1991, SNL/NM Radiation Protection Operations (RPO) conducted a beta-gamma radiation survey across part of SWMU 2. No radioactive anomalies were detected (Oldewage July 1991). A second beta-gamma survey in December 1991 determined that no significant external radiation dose rates to personnel were expected for nonintrusive field work (Oldewage December 1991).

5.4.3.4 Soil-Vapor Surveys

Two soil-vapor surveys (SVSs) were conducted at SWMU 2. In 1989, DOE collected six samples. The samples were collected from a depth of 4 feet at 20-foot intervals along one of the trenches. Although chlorinated solvents were detected at all six sample locations, VOCs also were detected in the method blanks, suggesting laboratory contamination (SNL/NM December 1997).

In 1993, a passive SVS investigation was conducted across the eastern part of TA-II. The passive SVS was conducted with several hundred Petrex™ tubes buried at a depth of 1 foot bgs. Although Petrex™ tubes provide only qualitative data, the investigation identified two small areas with VOCs in soil vapor along the northern edge of SWMU 2 (NERI June 1994, SNL/NM December 1997).

5.4.3.5 Borehole Sampling

During March 1994, boreholes were drilled at the two VOC anomaly locations identified during the 1993 passive SVS. The boreholes (TA2-BH-03 and TA2-BH-04) were drilled to depths of

100.5 and 55 feet, respectively, along the northern edge of SWMU 2. No landfill material was encountered in either borehole.

Soil samples were collected at approximately 5-foot intervals and analyzed for metals, HE compounds, VOCs, SVOCs, and radionuclides. Insignificant soil contamination was identified. One sample contained elevated chromium (50 mg/kg). In several samples, acetone, methylene chloride, bis(2-ethylhexyl) phthalate, and tritium were detected (SNL/NM December 1997).

5.4.3.6 *Geophysical Surveys*

Four geophysical investigations were conducted across the eastern half of TA-II prior to the start of the VCM. GEO-CENTERS, Inc. conducted towed-array surveys in December 1991 and February 1994 (GEO-CENTERS, Inc. January 1994) using the Surface Towed Ordnance Locator System (STOLS™) to identify buried ferrous objects. A separate electromagnetic (EM) survey was conducted between December 1993 and February 1994 (LAMB Associates May 1994). No anomalies were identified outside of the 1993 SWMU 2 boundary in these three surveys. The 1997 survey identified approximately 75 to 80 individual burials at the landfill (MDM/LAMB, Inc. November 1997). A cluster of four pits also was identified west of the suspect disposal area and were designated as 'W' for western pits (W-Pits).

The fourth survey in 1997 was conducted to delineate the actual burial area boundary for the VCM. In September 1997, an EM-61 survey was conducted on 5-foot grid spacing on both north-south and east-west traverses. The survey covered approximately 3.5 acres on the landfill proper and the surrounding area. A more sensitive east-west survey (on 2.5-foot grid spacing) was then conducted over the surface of the landfill. Since an EM-61 survey does not distinguish between ferrous and nonferrous items, a magnetometer survey was then conducted to specifically identify buried ferrous materials. The final EM-61 survey results are shown in Figure 5.4.3.6-1.

The geophysical surveys provided the most useful tool for determining where material was buried. These burial areas included the trench disposals, the ACF Pits, and the W-Pits. The final SWMU 2 boundary encompasses all the burial areas (Figure 5.4.3.6-2).

5.4.3.7 *Cultural Resources Survey*

A walk-over survey was conducted by an archaeologist in 1994. No cultural resources were identified in the vicinity of SWMU 2 (Hoagland September 1994).

5.4.3.8 *Sensitive-Species Surveys*

In 1995, two biological surveys were conducted in the vicinity of SWMU 2. The area around SWMU 2 was originally desert grassland habitat but has been highly disturbed by its past use as a landfill and other TA-II activities (IT February 1995). No federally-listed endangered or threatened species (plants or animals) or state-listed endangered wildlife species (Group 1 or Group 2) were found.

5.5 VCM Implementation

In the course of the SWMU 2 VCM, between March 1998 and February 2000, approximately 1.5 million pounds of material and 40,000 cubic yards of soil were excavated. The depth of the excavated pits and trenches ranged from 10 to 18 feet below grade, with an average depth of approximately 12 feet. The landfill was excavated by digging out one pit or trench disposal cell at a time, then separating the material, soil, and cobble fractions for further management. Further details describing the VCM methodology and procedures are provided in Annex 5-A.

Management and disposition of the large amounts of excavated material was a major part of the VCM. All the excavated material had to be considered classified from a national security standpoint until proven otherwise. The landfill contained classified material from nearly 40 years of weapons research and development at SNL/NM. Some material was excavated that was not classified, including lead bricks for shielding, sheet stock of steel, lead, cadmium, aluminum, stainless steel, and titanium, metal fragments from explosives testing, compressed gas cylinders, weapon casings, laboratory equipment, and discarded firearms. Weapon-related material included thermal batteries, firing sets, radar and fuzing units, electronic assemblies, partial and complete weapon trainers, and test assemblies from a variety of weapon systems. The material was collected from SNL/NM groups performing weapon component development and testing, stored in vaults until enough was accumulated for disposal, then placed in the landfill.

Disposition of the material involved surveying and identifying everything, separating hazardous and unclassified material, demilitarizing the classified material, sorting scrap metal for recycle, and waste characterization and packaging. Annex 5-B provides more details on the material management effort and the resulting recycling initiative and waste streams.

5.6 VCM Excavated Soil Characterization

Excavated-soil characterization, management, and verification sampling are described in the following sections.

5.6.1 Preliminary Remediation Goals and Excavated Soil Management

Before starting the VCM, preliminary human-health and ecological risk assessments were performed to establish a set of preliminary remediation goal (PRG) values for the metal and radiological COCs expected at SWMU 2. These risk-based PRG values were used to determine the in-process management and future disposition for excavated soil. The excavated soil was routinely field-screened and sampled for laboratory analysis (Sections 5.6.2.2 and 5.6.2.3) and staged in piles until analytical results were received and reviewed. For conservatism, action levels were set at 10 percent of the PRG. When the analytical results were received, soils with COC values above action level(s) or PRGs were stockpiled separately for further characterization. Soils with COC values below PRGs or action levels were combined and stockpiled for use as excavation backfill pending completion of the final SWMU 2 risk assessment.

Details on the methodology used to develop the PRGs are presented in the SWMU 2 VCM Plan (SNL/NM December 1997). The PRGs and NMED-approved background concentrations for the North Supergroup area are compared in Table 5.6.1-1. The soil sampling results and comparison with the PRGs are presented in Section 5.6.3.1.

5.6.2 Excavated Soil Characterization

As the pits and trenches were excavated during the VCM (Figure 5.6.2-1), the excavated soil was sampled to:

- Determine the nature and extent of any contamination;
- Monitor COC concentrations for health and safety and waste management decisions;
- Compare any COC concentrations with PRGs as an initial step in determining if soil could be used as backfill pending the final risk assessment;
- Provide data for the final human-health and ecological risk assessments.

Following the VCM excavation, confirmatory soil samples were collected from the excavation floor and sidewalls to determine whether any COCs were present at concentrations exceeding background limits or at levels sufficient to pose a risk to human health or the environment. Confirmatory sampling and results are described in Section 5.7.2.

Soil characterization included both field screening and on- and off-site laboratory analyses. Field-screening included metals analysis by X-ray fluorescence (XRF); soil headspace analysis for VOCs using a photoionization detector (PID); and radionuclide characterization by in-situ Large Area Gamma Spectroscopy (LAGS) and multiple portable detectors. Field-screening methods are discussed in Section 5.6.2.2. Laboratory analyses are discussed in Section 5.6.2.3.

Excavated soil was sampled and tracked as "soil lots" associated with individual pits or disposal cells. Soil lots were initially 10 cubic yards in volume, and increased to 50 cubic yards as the sampling frequency changed later in the project (Section 5.6.2.2). Excavated soil was kept segregated into soil piles until analytical results were received and reviewed. The results were used to segregate the soil for use as possible backfill for the VCM excavation.

5.6.2.1 Sample Naming Scheme

Samples were tracked using an identification scheme incorporating the sample location and sample details, such as: soil bin, soil lot, survey coordinates, sample depth, and sample type. For a typical sample like TA2-2-TRC8-001-SL04-S, "TA2-2" stands for Technical Area II, SWMU 2. The next set of characters, "TRC8," describe the location(s) sampled, in this case, Disposal Cell 8 in Trench (TR) C. The next set of characters, "001-SL04," further specify this as the first sample (001) from Soil Lot 4 (SL04). Excavation confirmatory samples include northing and easting coordinates based upon distance from a New Mexico State survey reference point

Table 5.6.1-1
Comparison of SWMU 2 Risk-Based PRGs and
NMED-Approved Background Values

COC Name	Proposed Risk-Based PRG	NMED-Approved Background[a]
Metals (mg/kg)		
Arsenic	1.9	4.4
Barium	509	200
Beryllium	6.7	0.80
Cadmium	209	0.9
Chromium[b]	1,590	12.8
Lead	2,000	11.2
Mercury	9.96	<0.1
Nickel	3,570	25.4
Selenium	5.86	<1
Silver	1,550	<1
Uranium	102	2.3
Radionuclides (pCi/g)		
Am-241	253	NE
Cs-137	22.1	0.084
H-3 (tritium)	2,980	0.021[c,d]
Pu-238	315	NE
Pu-239	285	NE
Ra-228	7.56	1.20
Sr-90	46.8	1.08
Th-228	7.06	1.54[e]
Th-230	2.47	NE
Th-232	4.45	1.54[e]
U-234	458	1.6
U-235	88.1	0.18
U-238	491	1.3

[a]Dinwiddie (September 1997) North Supergroup Background.
[b]Chromium assumed to be chromium VI (most conservative).
[c]SNL/NM tritium background value of 420 pCi/L from Tharp February 1999.
[d]Tritium background value calculated using 420 pCi/L, a soil density of 1 g/cubic centimeter, and moisture content of 5 percent.
[e]Th-228 and Th-232 assumed to be in equilibrium with each other.

COC = Constituent of concern.
g = Gram(s).
mg/kg = Milligram(s) per kilogram
NE = Not established.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
PRG = Preliminary remediation goal.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

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Figure 5.6.2-1
SWMU 2 During the VCM Excavation, View to the Southwest

and depth of the sample below grade. The final character set (S or SU, D or DU, EB, TB) specifies the type of sample (soil, duplicate, equipment blank, or trip blank, respectively). The acronyms and identifications used for samples are shown in Table 5.6.2-1. Trench and pit locations are shown on Figure 5.6.2-2.

5.6.2.2 Field-Screening Methods

When the VCM began in March 1998, field-screening soil samples were collected at a frequency of one sample for each 10 cubic yards of excavated soil. In December 1998, after more than 20,000 cubic yards had been processed and very little contamination had been found, the frequency was changed to one sample for each 50 cubic yards of excavated soil. The field-screening methods are discussed below.

<u>VOC Headspace Analysis by PID</u>

Soil samples were collected in plastic bags and allowed to sit at ambient temperature for 5 minutes before the headspace concentration was sampled with a PID. A total of 984 soil samples were analyzed for VOCs between March 1998 and February 2000. No readings above background were found.

<u>Metals Analysis by XRF</u>

Between March 1998 and February 2000, 846 soil samples were analyzed using XRF for barium, cadmium, chromium, lead, mercury, and nickel. After July 1999, arsenic, selenium, and silver were added to the analyte list and an additional 136 samples were analyzed. Because the XRF detector window glass contains beryllium, this metal was not detectable. The XRF results for the 982 samples are presented in Annex 5-C.

XRF results for each soil lot were reviewed and a determination was made whether to stockpile the soil or collect additional samples for analysis. For soil lots where XRF analysis indicated possible metal concentrations above background or a PRG, the original sample was rerun or a second sample was collected and analyzed. When the second XRF analysis indicated a probable contamination, another sample was sent for laboratory analysis. Additional samples of both "clean" and "potentially contaminated" samples were also periodically sent for laboratory analysis to confirm XRF accuracy.

<u>Radionuclide Assessment by LAGS</u>

Between March 1998 and December 1998, 590 10 cubic-yard soil lots were analyzed by the LAGS system. Each soil lot was given a 30-minute gamma spectroscopy count inside the temporary structure erected on the south end of the site. The LAGS data for the 590 soil lots are provided in Annex 5-D.

Soil samples also were submitted to the SNL/NM on-site Radiation Protection Sample Diagnostics (RPSD) Laboratory for gamma spectroscopy analysis at a rate of one for every five

Table 5.6.2-1
SWMU 2 Sample Naming Scheme

Explanation	Sample Location		Sample Details		Sample Type	
	Acronym	Explanation	Acronym	Explanation	Acronym	Explanation
TA2-2 = Technical Area 2, SWMU 2	ACF*4*	American Car Foundry Pit *4*	*C6*-BIN	Sample of soil scraped into a bin from artifacts found in disposal cell *C6*	D, DU, DUP	Duplicate sample
	BORROW	Soil sample from borrow area (used as backfill)	N, S, E, W	Sample locations on LAY-DOWN-BIN or PIT-BURM-MIX referenced to compass directions	EB*4*	Equipment blank *4*
	COBL-GRIZ	Sample of soil remaining after cobbles had been processed through screen plant	*001*-SL*04*	Sample *1* for Soil Lot *4*	S, SA, SU	Soil sample
	CWLF	Classified Waste Landfill				
	CYLI-NDER-BRM	Soil sample from berm around gas cylinder storage area	*500*N-*3800*E	NM State northing and easting coordinates for confirmatory samples collected from excavation floor or sidewall.	TB	Trip blank
	EAST-FNCE	Sample of overburden soil near the TA-2 east gate	*0.5, 12, 18*	Sample depth below grade. Only applicable to ACF, Western Pit and confirmatory samples.		
	FILL-DIRT	Sample collected between disposal cells 1 and 2 in Trench A.				
	FINAL-FLR	Confirmation sample from excavation floor				
	FINAL-SDW	Confirmation sample from excavation sidewall				
	4LAY-DOWN-BIN	Sample *4* from lay down pad or bin				
	OVER	Overburden soil sample				
	OVT*E*	Overburden soil from *Trench E*				

Table 5.6.2-1 (Concluded)
SWMU 2 Sample Naming Scheme

	Sample Location		Sample Details		Sample Type	
Explanation	Acronym	Explanation	Acronym	Explanation	Acronym	Explanation
TA2-2 (Cont.)	OVW*4*	Overburden soil from *Western Pit 4*				
	PIT-BURM-MIX	Composite soil sample made by scraping pit bottom and excavation berm				
	PW*3*	Western Pit *3*				
	PTW*4*	Western Pit *4*				
	P*456*	Composite soil sample from Pits *4, 5, and 6*				
	SLPE	Overburden soil from a graded slope excavated over Trench E				
	SORT-SEG	Sample of material scraped directly off artifact in the sorting and segregation area				
	TR*E*	Trench *E*				
	TR*E6*	Trench *E*, disposal cell *6*				
	TR*1*-P*6*	Trench *1*, Pit (disposal cell) *6*				
	TR*3*-P*2/3*	Composite soil sample from Trench *3*-Pits *2 and 3*				

Note: Italicized letters and numbers are for illustration purposes and may vary for actual samples.

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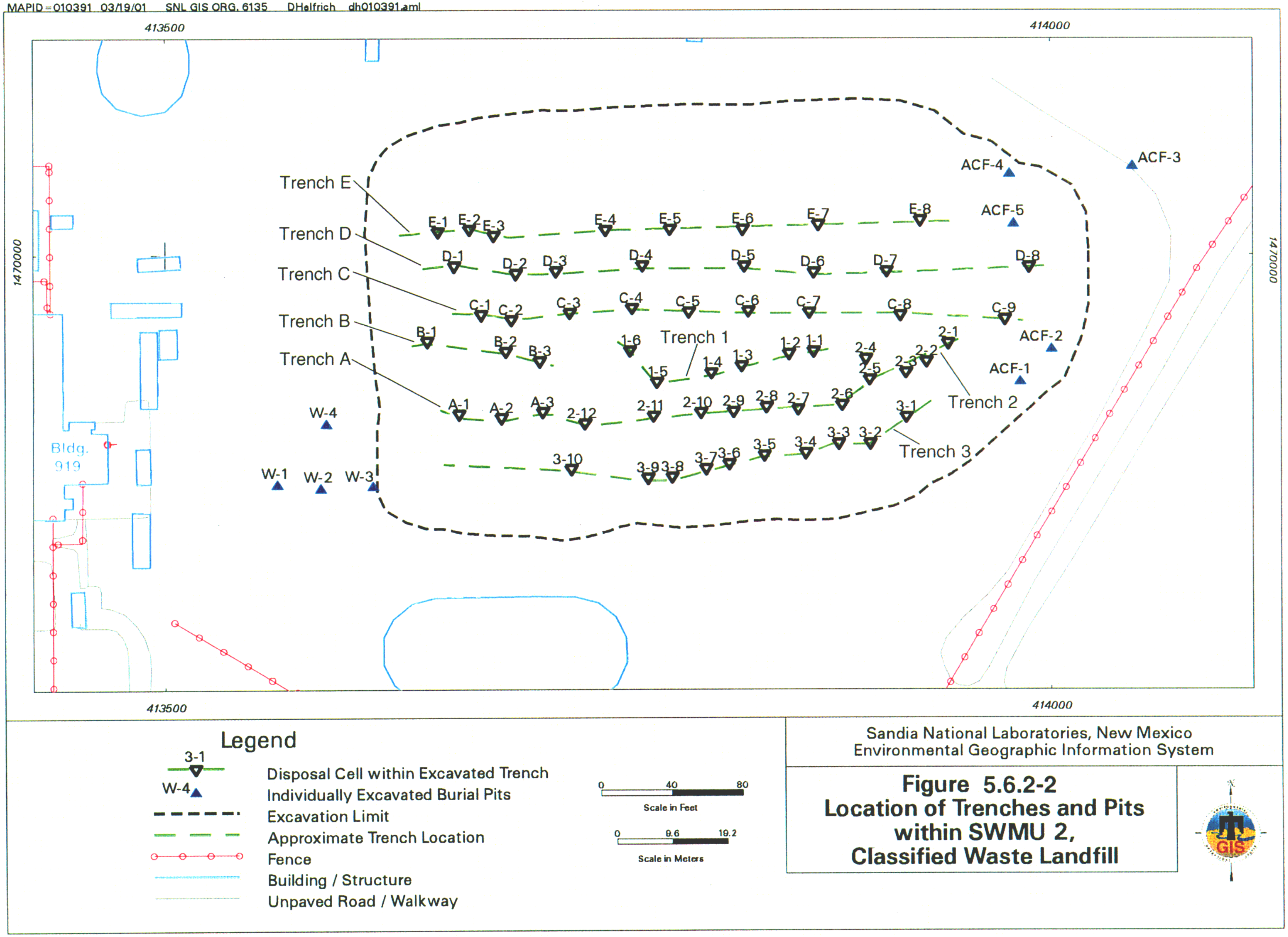

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.6.2-2
Location of Trenches and Pits within SWMU 2, Classified Waste Landfill

LAGS samples. The results for each soil lot were reviewed and a determination was made whether to stockpile the soil or collect additional samples for analysis. Since only minimal radioactive contamination was encountered, LAGS analysis was discontinued after December 1998 and the RPSD Laboratory samples were solely used for soil characterization. The sampling frequency was also decreased to one gamma spectroscopy sample for every 50 cubic yards of excavated soil.

The portable instruments used to used to field-screen for radioactive material during the VCM are described in Annex 5-A (Section 5A.3.2).

5.6.2.3 Laboratory Analyses

Soil samples were submitted for laboratory analysis at a ratio of one per 20 field-screening samples. These were split between the on-site SNL/NM ER Chemistry Laboratory and off-site General Engineering Laboratories, Inc. (GEL), in Charleston, South Carolina. Gamma spectroscopy and qualitative tritium screening analyses also were performed at the SNL/NM RPSD Laboratory. Gamma spectroscopy samples were submitted to the RPSD Laboratory at a ratio of one per five LAGS samples during the time the LAGS was in operation. Off-site radionuclide analyses were performed at GEL.

VOC analyses were by EPA Method 8260; SVOC analyses by EPA Method 8270, HE by EPA Method 8330 (EPA Method 8095 equivalent at the on-site Environmental Restoration Chemical Laboratory); Resource Conservation and Recovery Act (RCRA) metals plus beryllium, nickel, and uranium were by EPA Methods 6010/7000 and 6020; gamma spectroscopy by EPA Method 901.1 (or equivalent at the on-site RPSD Laboratory); and tritium by EPA Method 906.0. Qualitative tritium measurements were also performed at the RPSD Laboratory using liquid scintillation counting.

All of the confirmatory soil samples collected in the landfill excavation following the VCM were submitted to GEL for metals and tritium analysis. Gamma spectroscopy analyses were performed at the SNL/NM RPSD Laboratory. These results are discussed in Section 5.7.3.

5.6.2.4 Quality Assurance/Quality Control Samples

Quality assurance (QA)/quality control (QC) soil samples were collected at an approximate frequency of one per 20 field samples. These included duplicates, matrix spike (MS)/matrix spike duplicates (MSDs), equipment blanks, and trip blanks (the latter for VOC analysis only). QA/QC samples and data validation results for all samples collected are discussed in Section 5.7.4.

5.6.3 Excavated Soil Laboratory Analytical Results

As mentioned in Section 5.1, resampling of the excavated soil stockpiles confirmed the presence of PCBs in low concentrations. Additional characterization of the soil and excavation is currently being conducted and the results will be presented in an addendum to this NFA proposal. The COC analytical result discussions that follow do not include the analytical data from the latest sampling event in June 2001.

As mentioned in Section 5.6.2, as the landfill excavation progressed between March 1998 and February 2000, samples of the excavated soil were sent to analytical laboratories for confirmation of the field-screening results. These results are presented below.

VOCs

Table 5.6.3-1 presents the analytical results for the VOC analyses of the excavated soils. A total of seven VOC compounds were detected in the 116 soil samples collected between March 1998 and August 1999. Acetone (nondetect [ND] to 11 J micrograms (μg)/kg) was detected in four samples; ethylbenzene (ND to 4.3 J μg/kg) in one sample; 2-hexanone (ND to 14 J μg/kg) in two samples; methylene chloride (ND to 7.3 μg/kg) in four samples; and o-xylene (ND to 14 μg/kg) and m-, p-xylene (ND to 21 μg/kg) were detected in two samples. The low-level detections of these compounds probably indicate laboratory contamination rather than a release. The method detection limits (MDLs) for the analyses are provided in Table 5.6.3-2.

Laboratory analyses for VOCs in soil were discontinued in August 1999 because of the few detections, low concentrations of the VOCs that were detected, and continued lack of contamination indicated by visual observation and PID field-screening. The soil excavated was dry and unconsolidated, which indicated little potential for residual volatile contaminants. The materials in the landfill consisted primarily of prototype weapon components; no containers that may have contained liquids were found.

SVOCs

Nine soil samples were analyzed for SVOCs between March and December 1998, and only one SVOC compound was detected in one sample. Bis(2-ethylhexyl)phthalate (270 J μg/kg), a common constituent in plastics, was detected in the soil lot 9 sample from disposal cell E6. The results are presented in Table 5.6.3-3 and the MDLs for the SVOC analyses are presented in Table 5.6.3-4.

Eight of the nine SVOC samples were collected at the bottom of the four ACF and four W-Pits, and are also considered "confirmatory samples." However, because of the small number of analyses, the data is presented and discussed in this section. SVOC analyses were stopped in December 1998 because the material in the landfill was largely intact, despite oxidized metal surfaces. No stained soil was observed during the excavation and no containers that may have contained liquids were found.

HE

No HE compounds were detected in the 10 soil samples, including duplicates and splits, that were collected at SWMU 2. A summary of the MDLs used for the analyses is provided in Table 5.6.3-5. HE analyses were stopped when no HE compounds were detected in suspect materials (mock HE) or components that were analyzed. Sampling excavated soil for HE compounds was also discontinued early in the project when it became apparent that no bulk HE

Table 5.6.3-1
Summary of SWMU 2 Excavated Soil Sampling VOC Analytical Results
March 1998–August 1999
(On-site Laboratory, except where noted)

Sample Attributes			Analyte (EPA Method 8260/8260[a]) (µg/kg)						
Record Number[b]	ER Sample ID[c]	Sample Date	Acetone	Ethyl benzene	2-Hexanone	Methylene chloride	Toluene	o-Xylene	p-Xylene, m-Xylene
600003	TA2-2-BORROW-1	3-05-98	ND (5.4)	ND (2.2 J)	ND (5.4 J)	ND (1.1)	ND (1.1)	ND (2.2 J)	ND (3.2)
600003	TA2-2-BORROW-2	3-05-98	ND (5.4)	ND (2.2 J)	ND (5.4 J)	ND (1.1)	ND (1.1)	ND (2.2 J)	ND (3.3)
600046	TA2-2-ACF1-0001-SL2-S	4-01-98	ND (5.5 J)	ND (2.1)	ND (5.3)	ND (1)	ND (1)	ND (2.1)	ND (3.2)
600048	TA2-2-ACF4-0001-SL5-S	4-02-98	ND (5.2)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600061	TA2-2-PW12-0001-SL7-S	4-07-98	**8.1 J (21)**	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600061	TA2-2-PW12-0001-SL8-S	4-07-98	**11 J (21)**	ND (2.1)	**14 J (21)**	ND (1)	ND (1)	**4 J (8.4)**	**6.5 J (12)**
600066	TA2-2-ACF2-0001-SL4-S	4-13-98	ND (5.2)	**4.3 J (8.4)**	ND (5.2)	ND (1)	ND (1)	**14**	**21**
600069	TA2-2-PTW3-0001-SL4-S	4-14-98	**5.7 J (21)**	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600071	TA2-2-OVER-0001-SL2-S	4-16-98	R	R	R	R	R	R	R
600076	TA2-2-PTW4-SL14-000-S	4-24-98	ND (5)	ND (2)	ND (5 J)	ND (1)	ND (1)	ND (2)	ND (3)
600081	TA2-2-OVW4-0001-SL5-S	4-29-98	ND (5)	ND (2)	ND (5 J)	ND (1)	ND (1)	ND (2)	ND (3)
600083	TA2-2-OVW4-0001-SL8-S	5-04-98	ND (5.3 J)	ND (2.1)	ND (5.3)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600083	TA2-2-SLPE-0001-SL3-S	5-04-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600083	TA2-2-SLPE-0001-SL9-S	5-04-98	**7.6 J (21)**	ND (2.1)	ND (5.3)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600083	TA2-2-SLPE-SL14-000-S	5-04-98	ND (5.3 J)	ND (2.1)	ND (5.3)	ND (1)	ND (1)	ND (2.1)	ND (3.2)
600085	TA2-2-TRE1-SL06-000-S	5-06-98	ND (5.2 J)	ND (2.1 J)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1 J)	ND (3.1 J)
600085	TA2-2-TRE1-SL13-000-S	5-06-98	ND (5.2 J)	ND (2.1 J)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1 J)	ND (3.1 J)
600087	TA2-2-TRE2-SL07-000-S	5-11-98	ND (5.2 J)	ND (2.1 J)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1 J)	ND (3.1 J)
600277	TA2-2-SLPE-SL16-000-S	5-18-98	ND (5.2 J)	ND (2.1)	**8.3 J (21)**	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600277	TA2-2-SLPE-SL19-000-S	5-18-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600277	TA2-2-SLPE-SL22-000-S	5-18-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600277	TA2-2-SLPE-SL23-000-S	5-18-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600277	TA2-2-SLPE-SL32-000-S	5-18-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600277	TA2-2-SLPE-SL34-000-S	5-18-98	ND (5.1 J)	ND (2)	ND (5.1)	ND (1)	ND (1)	ND (2)	ND (3.1)
600279	TA2-2-TRE3-SL07-000-S	5-21-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600279	TA2-2-TRE4-SL10-000-S	5-21-98	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600281	TA2-2-OVTE-SL03-000-S	5-26-98	ND (5.3 J)	ND (2.1)	ND (5.3 J)	ND (1)	ND (1)	ND (2.1)	ND (3.2)
600281	TA2-2-OVTE-SL08-000-S	5-26-98	ND (5.3 J)	ND (2.1)	ND (5.3 J)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600285	TA2-2-OVTE-SL11-000-DUP	6-01-98	ND (5.3)	ND (2.1)	ND (5.3)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600285	TA2-2-OVTE-SL11-000-S	6-01-98	ND (5.3)	ND (2.1)	ND (5.3)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600285	TA2-2-TRE5-SL08-000-S	6-01-98	ND (5.2)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600285	TA2-2-TRE5-SL17-000-S	6-01-98	ND (5.2)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600290	TA2-2-TRE6-SL09-000-S	6-08-98	ND (5.2 J)	ND (2.1)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1)	ND (3.2)
600288	TA2-2-TRE6-SL09-000-S (off-site laboratory split)	6-08-98	ND (2.2)	ND (0.23)	ND (4.4)	**0.74 J (1)**	ND (0.22)	NA	NA
600290	TA2-2-TRE6-SL22-000-DUP	6-08-98	ND (5.2 J)	ND (2.1)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1)	ND (3.2)

Refer to footnotes at end of table.

Table 5.6.3-1 (Continued)
Summary of SWMU 2 Excavated Soil Sampling VOC Analytical Results
March 1998–August 1999
(On-site Laboratory, except where noted)

Sample Attributes			Analyte (EPA Method 8260/8260[a]) (µg/kg)						
Record Number[b]	ER Sample ID[c]	Sample Date	Acetone	Ethyl benzene	2-Hexanone	Methylene chloride	Toluene	o-Xylene	p-Xylene, m-Xylene
600290	TA2-2-TRE6-SL22-000-S	6-08-98	ND (5.2 J)	ND (2.1)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600292	TA2-2-OVA5-SL05-000-S	6-10-98	ND (5.2 J)	ND (2.1)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600292	TA2-2-OVA5-SL11-000-S	6-10-98	ND (5.3 J)	ND (2.1)	ND (5.3 J)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600292	TA2-2-OVA5-SL13-000-S	6-10-98	ND (5.2 J)	ND (2.1)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600296	TA2-2-TRE7-SL08-000-S	6-17-98	ND (5.3 J)	ND (2.1)	ND (5.3 J)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600296	TA2-2-TRE7-SL13-000-S	6-17-98	ND (5.2 J)	ND (2.1)	ND (5.2 J)	ND (1)	ND (1)	ND (2.1)	ND (3.2)
600296	TA2-2-TRE7-SL25-000-S	6-17-98	ND (5.3 J)	ND (2.1)	ND (5.3 J)	ND (1.1)	ND (1.1)	ND (2.1)	ND (3.2)
600299	TA2-2-TRE7-SL37-000-S	6-23-98	ND (26)	ND (11)	ND (53)	ND (5.3)	ND (5.3)	ND (11)	ND (16)
600299	TA2-2-TRE7-SL49-000-S	6-23-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600299	TA2-2-TRE7-SL55-000-S	6-23-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600301	TA2-2-TRE8-SL01-000-S	6-25-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600301	TA2-2-TRE8-SL14-000-S	6-25-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600303	TA2-2-TRE8-SL07-000-S	6-29-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600303	TA2-2-TRE8-SL21-000-S	6-29-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600303	TA2-2-TRE8-SL29-000-S	6-29-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (15)
600461	TA2-2-ACF5-SL06-000-S	7-07-98	ND (26)	ND (10)	ND (51)	ND (5.1)	ND (5.1)	ND (10)	ND (15)
600461	TA2-2-OVD1-SL01-000-S	7-07-98	ND (26)	ND (10)	ND (51)	ND (5.1)	ND (5.1)	ND (10)	ND (15)
600461	TA2-2-OVD2-SL02-000-S	7-07-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600463	TA2-2-TRD1-SL02-000-S	7-07-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600463	TA2-2-TRD1-SL06-000-S	7-07-98	ND (27)	ND (11)	ND (54)	ND (5.4)	ND (5.4)	ND (11)	ND (16)
600463	TA2-2-TRD1-SL09-000-S	7-07-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600463	TA2-2-TRD1-SL12-000-S	7-07-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600465	TA2-2-OVD3-SL01-000-S	7-13-98	ND (26)	ND (11)	ND (53)	ND (5.3)	ND (5.3)	ND (11)	ND (16)
600465	TA2-2-TRD2-SL01-000-S	7-13-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600465	TA2-2-TRD2-SL05-000-S	7-13-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600467	TA2-2-TRD3-SL03-000-S	7-20-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600467	TA2-2-TRD3-SL06-000-S	7-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600467	TA2-2-TRD3-SL12-000-S	7-20-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600470	TA2-2-TRD4-SL03-000-DUP	8-10-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600470	TA2-2-TRD4-SL03-000-S	8-10-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600470	TA2-2-TRD4-SL07-000-S	8-10-98	ND (27)	ND (11)	ND (53)	ND (5.3)	ND (5.3)	ND (11)	ND (16)
600470	TA2-2-TRD4-SL14-000-S	8-10-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600470	TA2-2-TRD5-SL05-000-DUP	8-10-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600470	TA2-2-TRD5-SL05-000-S	8-10-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600474	TA2-2-OVD4-SL03-000-S	8-17-98	ND (27)	ND (11)	ND (54)	ND (5.4)	ND (5.4)	ND (11)	ND (16)
600474	TA2-2-TRD6-SL03-000-S	8-17-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
600474	TA2-2-TRD6-SL08-000-S	8-17-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600474	TA2-2-TRD6-SL15-000-S	8-17-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)

Refer to footnotes at end of table.

Table 5.6.3-1 (Continued)
Summary of SWMU 2 Excavated Soil Sampling VOC Analytical Results
March 1998–August 1999
(On-site Laboratory, except where noted)

Sample Attributes			Analyte (EPA Method 8260/8260[a]) (µg/kg)						
Record Number[b]	ER Sample ID[c]	Sample Date	Acetone	Ethyl benzene	2-Hexanone	Methylene chloride	Toluene	o-Xylene	p-Xylene, m-Xylene
600474	TA2-2-TRD6-SL19-000-S	8-17-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600474	TA2-2-TRD6-SL23-000-S	8-17-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600489	TA2-2-OVD7-SL02-000-S	9-14-98	ND (26)	ND (10)	ND (52)	ND (6.9 J)	ND (5.2)	ND (10)	ND (16)
600489	TA2-2-OVD8-SL02-000-S	9-14-98	ND (26)	ND (10)	ND (52)	ND (6.8 J)	ND (5.2)	ND (10)	ND (16)
600489	TA2-2-TRD7-SL03-000-DUP	9-14-98	ND (26)	ND (10)	ND (53)	ND (7 J)	ND (5.3)	ND (10)	ND (16)
600489	TA2-2-TRD7-SL03-000-S	9-14-98	ND (26)	ND (11)	ND (53)	ND (6.6 J)	ND (5.3)	ND (11)	ND (16)
600489	TA2-2-TRD7-SL11-000-S	9-14-98	ND (26)	ND (10)	ND (53)	ND (6.3 J)	ND (5.3)	ND (10)	ND (16)
600489	TA2-2-TRD7-SL13-000-S	9-14-98	ND (26)	ND (10)	ND (52)	ND (6.7 J)	ND (5.2)	ND (10)	ND (16)
600489	TA2-2-TRD7-SL23-000-S	9-14-98	ND (26)	ND (10)	ND (52)	ND (6.9 J)	ND (5.2)	ND (10)	ND (16)
600493	TA2-2-SLPE-SL39-000-S	9-21-98	ND (26)	ND (10)	ND (52)	ND (6.7 J)	ND (5.2)	ND (10)	ND (16)
600493	TA2-2-SLPE-SL41-000-S	9-21-98	ND (26)	ND (10)	ND (53)	ND (6.6 J)	ND (5.3)	ND (10)	ND (16)
600502	TA2-2-TRD8-SL01-049-DUP	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (15)
600502	TA2-2-TRD8-SL01-049-S	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (15)
600502	TA2-2-TRD8-SL04-000-S	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (16)
600502	TA2-2-TRD8-SL16-000-S	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (16)
600502	TA2-2-TRD8-SL27-000-S	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (16)
600502	TA2-2-TRD8-SL33-000-S	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (16)
600502	TA2-2-TRD8-SL45-000-S	10-20-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2 J)	ND (10)	ND (16)
600505	TA2-2-SLPE-SL44-000-S	11-03-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (15)
600505	TA2-2-TRC9-SL01-000-S	11-03-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600506	TA2-2-TRC9-SL01-000-SP (off-site laboratory split)	11-03-98	R	ND (0.23)	ND (4.4)	ND (0.25 J)	ND (0.22)	NA	NA
600505	TA2-2-TRC9-SL05-000-S	11-03-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
600505	TA2-2-TRC9-SL19-000-S	11-03-98	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
601134	TA2-2-TRC9-SL24-000-S	11-17-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
601134	TA2-2-TRC9-SL42-000-S	11-17-98	ND (27)	ND (11)	ND (54)	ND (5.4)	ND (5.4)	ND (11)	ND (16)
601134	TA2-2-TRC9-SL57-000-S	11-17-98	ND (27)	ND (11)	ND (53)	ND (5.3)	ND (5.3)	ND (11)	ND (16)
601134	TA2-2-TRC9-SL71-000-S	11-17-98	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
601143	TA2-2-TRC7-SL01-000-S	1-14-99	ND (26)	ND (10)	ND (51)	ND (5.1)	ND (5.1)	ND (10)	ND (15)
601143	TA2-2-TRC7-SL21-000-S	1-14-99	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
601143	TA2-2-TRC8-SL04-000-S	1-14-99	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (15)
601143	TA2-2-TRC8-SL11-000-S	1-14-99	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
601143	TA2-2-TRC8-SL17-000-S	1-14-99	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
601143	TA2-2-TRC9-SL83-000-S	1-14-99	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
601145	TA2-2-TRC6-SL07-000-S	1-21-99	ND (26)	ND (10)	ND (53)	ND (5.3)	ND (5.3)	ND (10)	ND (16)
601154	TA2-2-TRC5-SL07-000-S	2-01-99	ND (26)	ND (10)	ND (52)	ND (5.2)	ND (5.2)	ND (10)	ND (16)
602606	TA2-2-EAST-FNCE-001-DU	8-23-99	ND (25)	ND (10)	ND (51)	ND (5.1)	ND (5.1)	ND (10)	ND (15)
602606	TA2-2-EAST-FNCE-001-S	8-23-99	ND (25)	ND (10)	ND (51)	ND (5.1)	ND (5.1)	ND (10)	ND (15)

Refer to footnotes at end of table.

Table 5.6.3-1 (Concluded)
Summary of SWMU 2 Excavated Soil Sampling VOC Analytical Results
March 1998–August 1999
(On-site Laboratory, except where noted)

Sample Attributes			Analyte (EPA Method 8260/8260[a]) (µg/kg)						
Record Number[b]	ER Sample ID[c]	Sample Date	Acetone	Ethyl benzene	2-Hexanone	Methylene chloride	Toluene	o-Xylene	p-Xylene, m-Xylene
602606	TA2-2-TR2-P12-SL6-DU	8-23-99	ND (25)	ND (10)	ND (50)	ND (5)	ND (5)	ND (10)	ND (15)
602606	TA2-2-TR2-P12-SL6-S	8-23-99	ND (25)	ND (10)	ND (50)	ND (5)	ND (5)	ND (10)	ND (15)
602607	TA2-2-TR2-EAST-FNCE-002-DU (off-site laboratory)	8-23-99	ND (10.3)	ND (0.3)	ND (2.8)	ND (1.4)	ND (0.9)	NA	NA
602607	TA2-2-TR2-EAST-FNCE-002-S (off-site laboratory)	8-23-99	ND (10.3)	ND (0.3)	ND (2.8)	**2.9 J (5)**	ND (0.9)	NA	NA
602607	TA2-2-TR2-P12A-SL6-DU (off-site laboratory)	8-23-99	ND (10.3)	ND (0.3)	ND (2.8)	**5.5**	ND (0.9)	NA	NA
602607	TA2-2-TR2-P12A-SL6-S (off-site laboratory)	8-23-99	ND (10.3)	ND (0.3)	ND (2.8)	**7.3**	ND (0.9)	NA	NA
Quality Assurance/Quality Control Samples (µg/L)									
600283	TA2-2-TRE5-001-EB	6-01-98	ND (2.2 J)	ND (0.23)	ND (4.4)	ND (4.6 J)	ND (0.22)	NA	NA
600283	TA2-2-TRE5-001-TB	6-01-98	R	R	R	R	R	NA	NA
600288	TA2-2-TRE6-SL09-000-TB	6-08-98	ND (2.2)	ND (0.23)	ND (4.4)	1	ND (0.22)	NA	NA
600459	TA2-2-TRD1-0006-EB	7-06-98	ND (2.2)	ND (0.23)	ND (4.4)	1.6	ND (0.22)	NA	NA
600459	TA2-2-TRD1-0006-TB	7-06-98	ND (2.2)	ND (0.23)	ND (4.4)	2.3	ND (0.22)	NA	NA
600472	TA2-2-TRD6-0015-EB	8-11-98	R	ND (0.23)	ND (4.4 J)	ND (1.1 J)	ND (0.22)	NA	NA
600472	TA2-2-TRD6-0015-TB	8-11-98	R	ND (0.23)	ND (4.4 J)	ND (1.5 J)	ND (0.22)	NA	NA
600494	TA2-2-TRD8-0025-EB	9-21-98	ND (3.7)	ND (0.3)	ND (3.2)	ND (1.2)	ND (0.5)	NA	NA
600494	TA2-2-TRD8-0025-TB	9-21-98	ND (3.7)	ND (0.3)	ND (3.2)	ND (1.2)	ND (0.5)	NA	NA
600506	TA2-2-TRC9-SL01-000-TB	11-03-98	R	ND (0.3)	ND (3.2)	ND (1.2)	ND (0.5)	NA	NA
601139	TA2-2-TRC7-0003-000-EB	11-30-98	ND (3.7)	ND (0.3)	ND (3.2)	1.5 J (5)	ND (0.5)	NA	NA
601139	TA2-2-TRC7-0003-000-TB	11-30-98	ND (3.7)	ND (0.3)	ND (3.2)	ND (1.2)	ND (0.5)	NA	NA
602607	TA2-2-TR2-EAST-TR2-P12-TB	8-23-99	ND (3.7)	ND (0.3)	ND (3.2)	ND (1.2)	ND (0.5)	NA	NA

Note: Values in **bold** represent detected VOCs.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample naming scheme is provided in Table 5.6.2-1.
[d]All quality assurance/quality control samples were analyzed by an off-site laboratory.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
H = The holding time was exceeded for the associated sample analysis.
ID = Identification.
J = Analytical result was qualified as an estimated value during data validation.
J ( ) = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not analyzed.
ND = Not detected above the method detection limit, shown in parentheses.
R = Rejected value. See Data Validation report.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 5.6.3-2
Summary of VOC Analytical Method Detection Limits
Used for SWMU 2 Excavation Confirmatory Soil Sampling
March 1998–August 1999
(On- and Off-site Laboratories)

Analyte	Soil Sample MDL (EPA Method 8260[a]) (µg/kg)	Aqueous Sample MDL (EPA Method 8260[a]) (µg/L)
1,1,1-Trichloroethane	0.1–5.4	0.18–1
1,1,2,2-Tetrachloroethane	0.46–5.4	0.46–1
1,1,2-Trichloroethane	0.24–5.4	0.24–1
1,1-Dichloroethane	0.1–5.4	0.2–1
1,1-Dichloroethene	0.25–5.4	0.25–1
1,2-Dichloroethane	0.2–5.4	0.2–1
1,2-Dichloropropane	0.2–5.4	0.2–1
2-Butanone	2–27	2–5.9
2-Hexanone	2–54	2–4.4
4-methyl-, 2-Pentanone	2–27	1.6–2.9
Acetone	2–27	2–3.7
Benzene	0.25–5.4	0.25–1
Bromodichloromethane	0.1–5.4	0.24–1
Bromoform	0.27–5.4	0.27–1
Bromomethane	0.3–5.4	0.3–1
Carbon disulfide	0.3–5.4	1.8–2.2
Carbon tetrachloride	0.22–5.4	0.2–1
Chlorobenzene	0.25–5.4	0.25–1
Chloroethane	0.3–5.4	0.3–1
Chloroform	0.1–5.4	0.24–1
Chloromethane	0.2–5.4	0.2–1
Dibromochloromethane	0.2–5.4	0.21–1
Ethyl benzene	0.23–11	0.23–1
Methylene chloride	0.25–5.4	0.25–1.2
Styrene	0.22–5.4	0.2–1
Tetrachloroethene	0.23–11	0.23–1
Toluene	0.22–5.4	0.22–1
Trichloroethene	0.27–5.4	0.27–1
Vinyl acetate	1.8–2.1	1.8–2.0
Vinyl chloride	0.4–5.4	0.4–1
Xylene	0.62–2	0.62–3
cis-1,2-Dichloroethene	0.1–5.4	0.25–1
cis-1,3-Dichloropropene	0.2–2.7	0.25–1
o-Xylene	2–11	NA
p-Xylene, m-Xylene	3–16	NA
trans-1,2-Dichloroethene	0.1–5.4	0.19–1
trans-1,3-Dichloropropene	0.22–5.4	0.22–1

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not analyzed.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 5.6.3-3
Summary of SWMU 2 Excavated Soil and Confirmatory Soil Sampling
SVOC Analytical Results
March–November 1998
(Off-site Laboratory)

Sample Attributes			Analyte (EPA Method 8270[a]) (µg/kg)
Record Number[b]	ER Sample ID[c]	Sample Depth (ft)	bis(2-Ethylhexyl)phthalate
600004	TA2-2-ACF1-0001-18-S[d]	18	ND (167)
600007	TA2-2-ACF2-0001-15-S[d]	15	ND (167)
600010	TA2-2-ACF3-0001-12-S[d]	12	ND (167)
600041	TA2-2-ACF4-0001-12-S[d]	12	ND (167)
600047	TA2-2-PTW1-0001-10-S[d]	10	ND (167)
600062	TA2-2-PTW2-0001-12-S[d]	12	ND (167)
600067	TA2-2-PTW3-0001-12-S[d]	12	ND (170)
600072	TA2-2-PTW4-0001-15-S[d]	15	ND (170)
600288	TA2-2-TRE6-SL09-000-S	NA	**270 J (331)**
Quality Assurance/Quality Control Samples (µg/L)			
600059	TA2-2-PTW1-EB[d]	NA	ND (5)
600283	TA2-2-TRE5-001-EB	NA	ND (5)
600459	TA2-2-TRD1-0006-EB	NA	ND (5)
600472	TA2-2-TRD6-0015-EB	NA	ND (5)
600494	TA2-2-TRD8-0025-EB	NA	ND (3.7)
601139	TA2-2-TRC7-0003-000-EB	NA	ND (3.7)

Note: Values in **bold** represent detected SVOCs.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample naming scheme is provided in Table 5.6.2-1.
[d]Excavation confirmatory soil sample.
EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J ( ) = The reported value is greater than or equal to the MDL but is less than the reporting limit, shown in parentheses.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not applicable.
ND = Not detected above the MDL, shown in parentheses.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 5.6.3-4
Summary of SVOC Analytical Method Detection Limits
Used for SWMU 2 Excavation Confirmatory Soil Sampling
March–November 1998
(Off-site Laboratory)

Analyte	Soil Sample MDL (EPA Method 8270[a]) (µg/kg)	Aqueous Sample MDL (EPA Method 8270[a]) (µg/L)
1,2,4-Trichlorobenzene	167–170	2.4–5
1,2-Dichlorobenzene	167–170	2.7–5
1,2-Diphenylhydrazine	167–170	2.3–5
1,3-Dichlorobenzene	167–170	2.5–5
1,4-Dichlorobenzene	167–170	2.3–5
2,4,5-Trichlorophenol	167–170	2.5–5
2,4,6-Trichlorophenol	167–170	0.96–5
2,4-Dichlorophenol	167–170	1.4–5
2,4-Dimethylphenol	167–170	5–6.1
2,4-Dinitrophenol	330–333	7.9–10
2,4-Dinitrotoluene	167–170	1.4–5
2,6-Dinitrotoluene	167–170	1.1–5
2-Chloronaphthalene	167–170	2.4–5
2-Chlorophenol	167–170	2.1–5
2-Methylnaphthalene	167–170	3.2–5
2-Nitroaniline	167–170	2.8–5
2-Nitrophenol	167–170	2.9–5
3,3'-Dichlorobenzidine	830–833	4.2–25
3-Nitroaniline	167–170	1.8–6
4-Bromophenyl phenyl ether	167–170	0.03–5
4-Chloro-3-methylphenol	167–170	3.1–5
4-Chlorobenzenamine	167–333	1.5–6
4-Chlorophenyl phenyl ether	167–170	2.8–5
4-Nitroaniline	167–170	1–5
4-Nitrophenol	167–333	3.5–10
Acenaphthene	167–170	2.2–5
Acenaphthylene	167–170	1.3–5
Anthracene	167–170	2.3–5
Benzo(a)anthracene	167–170	2.8–5
Benzo(a)pyrene	167–170	2–5
Benzo(b)fluoranthene	167–170	4.7–5
Benzo(ghi)perylene	167–170	2.5–5
Benzo(k)fluoranthene	167–170	2.6–5
Benzoic acid	330–333	9.3–10
Benzyl alcohol	167–170	2.5–5
Butylbenzyl phthalate	167–170	3.7–5
Chrysene	167–170	2.2–5
Di-n-butyl phthalate	167–170	2.9–5
Di-n-octyl phthalate	167–170	4.2–5
Dibenz[a,h]anthracene	167–170	2.2–5
Dibenzofuran	167–170	4.3–5

Refer to footnotes at end of table.

Table 5.6.3-4 (Concluded)
Summary of SVOC Analytical Method Detection Limits
Used for SWMU 2 Excavation Confirmatory Soil Sampling
March–November 1998
(Off-site Laboratory)

Analyte	Soil Sample MDL (EPA Method 8270[a]) (µg/kg)	Aqueous Sample MDL (EPA Method 8270[a]) (µg/L)
Diethylphthalate	167–170	2.1–5
Dimethylphthalate	167–170	2.1–5
Dinitro-o-cresol	167–170	0.67–5
Fluoranthene	167–170	3.1–5
Fluorene	167–170	2.1–5
Hexachlorobenzene	167–170	2.9–5
Hexachlorobutadiene	167–170	3.8–5
Hexachlorocyclopentadiene	167–170	4.4–5
Hexachloroethane	167–170	3.4–5
Indeno(1,2,3-c,d)pyrene	167–170	3.4–5
Isophorone	167–170	2.6–5
Naphthalene	167–170	2–5
Nitro-benzene	167–170	3.3–5
Pentachlorophenol	167–170	2.8–5
Phenanthrene	167–170	1.8–5
Phenol	167–170	0.8–5
Pyrene	167–170	2.5–5
bis(2-Chloroethoxy)methane	167–170	2.5–5
bis(2-Chloroethyl)ether	167–170	2–5
bis(2-Ethylhexyl)phthalate	167–170	3.7–5
bis-Chloroisopropyl ether	167–170	0.61–5
m,p-Cresol	167–170	1.8–5
n-Nitrosodiphenylamine	167–170	5
n-Nitrosodipropylamine	167–170	5
o-Cresol	167–170	2.1–5

[a]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.

Table 5.6.3-5
Summary of HE Analytical Method Detection Limits Used for
SWMU 2 Excavated Soil Sampling
August 1999
(On- and Off-site Laboratories)

Analyte	Soil Sample MDL (µg/kg)	
	On-site Laboratory (EPA Method 8095[a])	Off-site Laboratory (EPA Method 8330[b])
1,3-Dinitrobenzene	250	4.1
2-Amino-4,6-dinitrotoluene	250	NA
2,4-Dinitrotoluene	250	6.2
2,6-Dinitrotoluene	250	6.5
HMX	NA	5.3
Nitrobenzene	250	5.2
m-Nitrotoluene	250	7.8
o-Nitrotoluene	250	11
p-Nitrotoluene	250	11
Pentaerythritol tetranitrate	500	NA
RDX	250	9.7
Tetryl	NA	7.5
1,3,5-Trinitrobenzene	250	6.6
2,4,6-Trinitrotoluene	250	5.7

[a]EPA November 1998.
[b]EPA November 1986.
EPA = U.S. Environmental Protection Agency.
HE = High explosive(s).
HMX = 1,3,5,7-Tetranitro-1,3,5,7-tetrazacyclooctane.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
NA = Not analyzed.
RDX = 1,3,5-Trinitro-1,3,5-triazacyclohexane.
SWMU = Solid Waste Management Unit.
Tetryl = 2,4,6-Trinitrophenylmethylnitramine.

or explosive components had been disposed in the landfill. References to HE in the site disposal history were based upon very small, sealed charges (less than one gram) used as highly reliable switching devices within weapons components. Because the components and sealed charges were excavated in intact condition, there was very little chance for an HE release to the soil.

RCRA Metals plus Beryllium, Nickel, and Uranium

Table 5.6.3-6 presents the analytical results for the RCRA metals plus beryllium, nickel, and uranium analyses of the excavated soils. Most metal concentrations were at or below NMED-approved background values. Many of the highest concentrations measured for barium, beryllium, cadmium, chromium, lead, mercury, and silver were present in adhering soil scraped directly off artifacts into bins (bin soil samples.)

The metals results are summarized below.

- Arsenic (ND to 8.3 mg/kg) was detected in only 5 of the 304 samples at concentrations above the NMED-approved background of 4.4 mg/kg.
- Barium (77 to 8,100 mg/kg) was detected in 126 of 310 samples at concentrations above the NMED-approved background of 200 mg/kg.
- Beryllium (ND to 4.2 mg/kg) was detected in 6 of 310 samples at concentrations above the NMED-approved background of 0.8 mg/kg.
- Cadmium (ND to 740 mg/kg) was detected in 199 of 310 samples at concentrations above the NMED-approved background of 0.9 mg/kg.
- Chromium (4.6 to 460 mg/kg) was detected in 118 of 310 samples at concentrations above the NMED-approved background of 12.8 mg/kg.
- Lead (3.4 to 620 J mg/kg) was detected in 100 of 310 samples at concentrations above the NMED-approved background of 11.2 mg/kg.
- Mercury (ND to 180 mg/kg) was detected in 224 of 310 samples at concentrations above the NMED-approved background of 0.1 mg/kg.
- Nickel (5 to 400 mg/kg) was detected in 35 of 310 samples at concentrations above the NMED-approved background of 25.4 mg/kg.
- Selenium (ND to 250 mg/kg) was detected in 30 of 303 samples at concentrations above the NMED-approved background of 1 mg/kg.
- Silver (ND to 110 mg/kg) was detected in 87 of 304 samples at concentrations above the NMED-approved background of 1 mg/kg.
- Uranium (0.51 to 4.5 mg/kg) was detected in 4 of 268 samples at concentrations above the NMED-approved background of 2.3 mg/kg.

Table 5.6.3-7 presents the relative percent difference (RPD) results for the metals analyses performed for the 42 duplicate samples of excavated soil. RPDs were only calculated for detections and were not calculated for results that were qualified "J" during data validation. As a consequence, only two RPDs could be calculated for selenium and nine for barium. RPDs ranged from 2.6 to 37.5 for arsenic, 1.0 to 29.2 for barium, 0.0 to 34.8 for beryllium, 1.04 to 179.7 for cadmium, 0.0 to 190.7 for chromium, 0.0 to 84.0 for lead, 0.0 to 134.6 for mercury, 0.0 to 110.5 for nickel, 0.0 to 170.8 for silver, and 0.0 to 131.4 for uranium. Soil or sample heterogeneity is probably responsible for most of the RPD variations.

Radionuclides

Table 5.6.3-8 presents the analytical results for the gamma spectroscopy analysis of the 391 excavated soil samples. The minimum detectable activities (MDAs) for the analyses are presented in Table 5.6.3-9.

The gamma spectroscopy results are summarized below.

- Cesium-137 (ND to 0.247 picocuries (pCi)/gram (g) was detected in only three samples at an activity above the 0.084 pCi/g NMED-approved background value.
- Thorium-232 (ND to 3.58 pCi/g) was detected in only one sample above the 1.54 pCi/g background value.
- Uranium-235 (ND to 3.28 pCi/g) was detected in 15 samples above the 0.18 pCi/g approved value.
- Uranium-238 (ND to 208 pCi/g) was detected in 10 samples above the 1.3 pCi/g approved value. Nine of the elevated activities were in the 1.33 to 3.16 pCi/g range, while only one was at 208 pCi/g.
- Neither plutonium or it's readily detectable daughter product (Americium-241) were detected in initial gamma spectroscopic analyses of the soil. Therefore, no isotopic plutonium analyses were performed.

Tritium

Table 5.6.3-10 presents the analytical results for tritium analysis of 160 excavated soil samples. Tritium at activities ranging from 20,300 to 1,718,000 pCi/liter (L) exceeded the 420 pCi/L SNL/NM-established background (Tharp February 1999) in 138 samples.

Tritium samples were analyzed at the RPSD Laboratory by liquid scintillation counting (LSC) and activity was measured in pCi/g. For comparison with the off-site laboratory values, these activities were converted to pCi/L using the assumptions of 5 percent soil moisture and soil density of 1 g/cubic centimeter. The poor correlation with sample splits analyzed off-site using the distillation method may be the result of the way tritium is present in this soil. If tritium is bound in the form of metal tritides or adsorbed onto the surface of metals and rubber, plastic, etc. (substituting for hydrogen molecules), it might not be readily extracted by distillation. If this is the case, the LSC values might be more representative of the tritium content in soil. For added conservatism, the higher converted LSC values were used in the risk assessment.

5.6.3.1 Comparison of Excavated Soil Analytical Results to Background and PRGs

As previously discussed in Section 5.6.1, soil excavated during the VCM was considered for reuse as excavation backfill if the soil did not contain COCs above the PRG values established at the start of the VCM and it passed a final risk assessment. Table 5.6.3.1-1 shows the number of samples where metal concentrations and radiological activities, the primary COCs at the site, exceeded the NMED-approved background values. The greatest number of metal detections above background were for mercury, cadmium, barium, chromium, and lead. Only a few of the samples exceed the NMED-approved background for radionuclides. No soil lot sampled exceeded the radiological PRGs, and, except for arsenic, barium, cadmium, mercury, and selenium, very few soil lots exceeded the PRGs for metals. The majority of soil samples

Table 5.6.3-6
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
Soil Excavated from Pits and Trenches								
600046	TA2-2-ACF1-0001-SL2-S	4-01-98	NA	130 J	0.54 J (0.57)	**6**	**22**	11
600066	TA2-2-ACF2-0001-SL4-S	4-13-98	3	190 J	0.43	**1.1**	10	8.6
600039	TA2-2-ACF3-0001-SLI-SU	3-23-98	NA	99	0.34	**1.3**	9.4	6.6
600039	TA2-2-ACF4-0001-SLI-SU	3-24-98	NA	180	0.44	**12**	**37**	**17**
600048	TA2-2-ACF4-0001-SL5-S	4-02-98	NA	160 J	0.64	**27 J**	**34**	**17**
600461	TA2-2-ACF5-SL06-000-S	7-07-98	3.3	200 J	0.31	0.49	6.1	5.6
600061	TA2-2-PW12-0001-SL7-S	4-07-98	NA	180 J	0.42	**4.1 J**	11	**15**
600061	TA2-2-PW12-0001-SL8-S	4-07-98	NA	120	0.38	**4.3 J**	12	6.6
600069	TA2-2-PTW3-0001-SL4-S	4-14-98	2.8	190 J	0.33	**15 J**	11	8.1
600076	TA2-2-PTW4-SL14-000-S	4-24-98	2.7	190 J	0.38	**19 J**	10	**14**
600085	TA2-2-TRE1-SL06-000-S	5-06-98	2.4	170 J	0.39	1.2	12	5.2
600085	TA2-2-TRE1-SL13-000-S	5-06-98	2.8 J	150 J	0.42 J	1.5 J	10 J	7.7 J
600087	TA2-2-TRE2-SL07-000-S	5-11-98	3 J	180 J	0.51 J	1.2 J	9.8 J	6.2 J
600279	TA2-2-TRE3-SL07-000-S	5-21-98	2.9	**210 J**	0.34	**2.5**	**14**	6.8
600279	TA2-2-TRE4-SL10-000-S	5-21-98	3.7	**220 J**	0.37	0.75	9.8	6
600285	TA2-2-TRE5-SL17-000-S	6-01-98	2.7	200 J	0.34	0.81	7.7	5.1
600285	TA2-2-TRE5-SL08-000-S	6-01-98	3	200 J	0.3	0.89	5.9	4.6
600288	TA2-2-TRE6-SL09-000-S (off-site laboratory)	6-08-98	3.58	**216**	0.384 J (0.467)	**0.996**	8.02	5.67
600290	TA2-2-TRE6-SL09-000-S	6-08-98	3.1	**230 J**	0.41	**1.3**	11	6.5
600290	TA2-2-TRE6-SL22-000-S	6-08-98	2.6	200 J	0.41	0.88	9.6	5.3
600290	TA2-2-TRE6-SL22-000-DUP	6-08-98	3.4	150 J	0.38	**0.95**	9.8	5.7
600296	TA2-2-TRE7-SL08-000-S	6-17-98	3.1	170 J	0.4	0.82	6	4.7
600296	TA2-2-TRE7-SL13-000-S	6-17-98	4	**250 J**	0.37	**1.9**	7	5.7
600296	TA2-2-TRE7-SL25-000-S	6-17-98	3.4	**210 J**	0.35	0.86	6.8	5.7
600299	TA2-2-TRE7-SL37-000-S	6-23-98	2.9	170	0.35	0.46	7.7	7.3
600299	TA2-2-TRE7-SL49-000-S	6-23-98	2.4 J (2.6)	120	0.26	0.32	4.7	3.9

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
600299	TA2-2-TRE7-SL55-000-S	6-23-98	2.9	160	0.36	0.64	5.7	4.8
600301	TA2-2-TRE8-SL01-000-S	6-25-98	3.4	**220**	0.37	0.43	7.5	5.6
600301	TA2-2-TRE8-SL14-000-S	6-25-98	3.2	180	0.31	0.24	6.1	4.7
600303	TA2-2-TRE8-SL07-000-S	6-29-98	3.8	**210**	0.41	0.43	9.5	5.8
600303	TA2-2-TRE8-SL21-000-S	6-29-98	3.5	**220**	0.42	0.38	8.8	5.9
600303	TA2-2-TRE8-SL29-000-S	6-29-98	3	190	0.36	0.38	8.2	4.8
600463	TA2-2-TRD1-SL02-000-S	7-07-98	2.6	160 J	0.35	0.7	6.8	4.4
600463	TA2-2-TRD1-SL06-000-S	7-07-98	2.4 J (2.5)	**230 J**	0.3	**1.6**	7.1	4.6
600463	TA2-2-TRD1-SL09-000-S	7-07-98	3.1	170 J	0.37	0.87	7.4	6.7
600463	TA2-2-TRD1-SL12-000-S	7-07-98	2.6	160 J	0.26	0.59	6.9	4.4
600465	TA2-2-TRD2-SL01-000-S	7-13-98	3.1	200 J	0.36	**1.2**	12	7.5
600465	TA2-2-TRD2-SL05-000-S	7-13-98	3	190 J	0.4	0.85	12	5.6
600467	TA2-2-TRD3-SL03-000-S	7-20-98	3.3	**220 J**	0.4	0.88	**13**	5.4
600467	TA2-2-TRD3-SL06-000-S	7-20-98	2.9	170 J	0.44	**12**	8.1	4.7
600467	TA2-2-TRD3-SL12-000-S	7-20-98	3.2	190 J	0.4	**3.6**	11	5.9
600470	TA2-2-TRD4-SL03-000-S	8-10-98	3.2	190 J	0.37	0.66	7.5	5.7
600470	TA2-2-TRD4-SL03-000-DUP	8-10-98	3.4	**220 J**	0.51	**1.1**	7.4	5.2
600470	TA2-2-TRD4-SL07-000-S	8-10-98	3.3	**230 J**	0.33	0.79	7.3	4.8
600470	TA2-2-TRD4-SL14-000-S	8-10-98	3	200 J	0.33	0.88	7.2	5.4
600470	TA2-2-TRD5-SL05-000-S	8-10-98	2.5	140 J	0.3	0.43	5.1	4.5
600470	TA2-2-TRD5-SL05-000-DUP	8-10-98	3.1	160 J	0.3	0.54	5.9	5.5
600474	TA2-2-TRD6-SL03-000-S	8-17-98	3.5	**240 J**	0.39	**1.9**	8.2	6.4
600474	TA2-2-TRD6-SL08-000-S	8-17-98	2.5 J (2.6)	**210 J**	0.3	**0.98**	7.2	5
600474	TA2-2-TRD6-SL15-000-S	8-17-98	2.6	**210 J**	0.36	0.6	5.9	5
600474	TA2-2-TRD6-SL19-000-S	8-17-98	2.4 J (2.6)	**230 J**	0.37	0.84	8.5	5.4
600474	TA2-2-TRD6-SL23-000-S	8-17-98	2.3 J (2.4)	190 J	0.27	0.69	5.3	4.4
600489	TA2-2-TRD7-SL03-000-S	9-14-98	3.6	**270 J**	0.32	**1.7 J**	7.5	9.3
600489	TA2-2-TRD7-SL03-000-DUP	9-14-98	3.3	**240**	0.34	**2.4**	8.9	7.1

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
600489	TA2-2-TRD7-SL11-000-S	9-14-98	3.3	**270 J**	0.4	**2 J**	8.5	7.7
600489	TA2-2-TRD7-SL13-000-S	9-14-98	3.8	180 J	0.36	**1.3 J**	9	7.2
600489	TA2-2-TRD7-SL23-000-S	9-14-98	3.4	**240 J**	0.33	**5.6 J**	8.9	9.2
600502	TA2-2-TRD8-SL01-049-S	10-20-98	3.1	**210 J**	0.37	**9.7**	9.5 J	**15**
600502	TA2-2-TRD8-SL01-049-DUP	10-20-98	2.9	**210 J**	0.39	**9.6**	**15 J**	10
600502	TA2-2-TRD8-SL04-000-S	10-20-98	3.3	**620 J**	0.38	**7.1**	12 J	11
600502	TA2-2-TRD8-SL16-000-S	10-20-98	2.6	190 J	0.38	**12**	11 J	7.5
600502	TA2-2-TRD8-SL27-000-S	10-20-98	3	**230 J**	0.37	**11**	9.2 J	**12**
600502	TA2-2-TRD8-SL33-000-S	10-20-98	3.2	**260 J**	0.38	**14**	10 J	9
600502	TA2-2-TRD8-SL45-000-S	10-20-98	3.2	**270 J**	0.38	**9.4**	11 J	8.3
600505	TA2-2-TRC9-SL01-000-S	11-03-98	2.8	**210 J**	0.37	**6.6**	8.7	9.3
600505	TA2-2-TRC9-SL05-000-S	11-03-98	2.6	170 J	0.33	**6.2**	**18**	**28**
600505	TA2-2-TRC9-SL19-000-S	11-03-98	3.2	**290 J**	0.38	**3.2**	8.7	7.2
601134	TA2-2-TRC9-SL24-000-S	11-17-98	3.4	**210 J**	0.38	**3.5**	**13**	10
601134	TA2-2-TRC9-SL42-000-S	11-17-98	3.5	**230 J**	0.37	**2**	8.9	8.6
601134	TA2-2-TRC9-SL57-000-S	11-17-98	3.2	190 J	0.34	**1.9**	8.6	7.3
601134	TA2-2-TRC9-SL71-000-S	11-17-98	2.9	190 J	0.28	**3.8**	7.3	6.1
601143	TA2-2-TRC7-SL01-000-S	1-14-99	2.2 J (2.4)	180 J	0.32 J	**4.1**	8.2 J	6.5
601143	TA2-2-TRC7-SL21-000-S	1-14-99	3.3 J	200 J	0.39 J	**1.8**	11 J	7.1
601143	TA2-2-TRC8-SL04-000-S	1-14-99	2.9 J	170 J	0.34 J	**7.8**	9.6 J	11
601143	TA2-2-TRC8-SL11-000-S	1-14-99	3.4 J	**280 J**	0.39 J	**8.6**	12 J	**15**
601143	TA2-2-TRC8-SL17-000-S	1-14-99	3.7 J	180 J	0.37 J	**10**	10 J	9.9
601143	TA2-2-TRC9-SL83-000-S	1-14-99	1.7 J (2.5)	**1500 J**	0.34 J	**6.4**	**140 J**	**39**
601145	TA2-2-TRC6-SL07-000-S	1-21-99	4 J	**240 J**	0.46 J	**2.3**	**15 J**	8.2
601154	TA2-2-TRC5-SL07-000-S	2-01-99	4	**210**	0.4	**2.1**	12	7.7
601596	TA2-2-TRC3-SL04-000-S	3-11-99	2.8	**250**	0.39	**1.4**	6	5.5
601596	TA2-2-TRC4-SL08-000-S	3-10-99	2.2 J (2.3)	180	0.29	0.59	5.9	**21**
601601	TA2-2-TRC3-SL12-000-S	3-29-99	3.5	**220 J**	0.49	**3.1**	10	8.9 J

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
601603	TA2-2-TRC2-SL02-000-S	4-07-99	3.1	200 J	0.5	**2 J**	9.1 J	7.1 J
601605	TA2-2-TRC1-SL06-000-S	4-08-99	3.4	**220 J**	0.42	**1.7 J**	8.2 J	6.6 J
601607	TA2-2-TRB1-SL03-000-S	4-13-99	3.8	**240 J**	0.47	**1.6 J**	11 J	8 J
601728	TA2-2-TRB2-SL01-000-S	4-21-99	4.4	**230 J**	0.65	**2.3**	**14**	6 J
601731	TA2-2-TRB3-SL01-000-S	4-27-99	3.7	**270 J**	0.5	**2.1**	**16**	5.8 J
601743	TA2-2-TRB3-SL16-000-S	6-07-99	**8.3**	**280 J**	0.54	**16 J**	**14**	9.1
602082	TA2-2-TRA3-SL02-000-S	6-17-99	2.1 J (2.2)	150 J	0.39	**3.9**	12	5.6 J
602088	TA2-2-TRA3-SL07-000-S	6-28-99	2.6	**220 J**	0.47	**11**	**16**	7.6 J
602093	TA2-2-TRA2-SL06-000-S	7-07-99	2.6	**210 J**	ND (0.027 J)	**5.9**	9.9	7.1 J
602099	TA2-2-TRA1-SL01-000-S	7-28-99	1.4 J (2.5)	98 J	0.31	**2.4**	5	**100**
602597	TA2-2-TR3-P10-SL1-S	8-18-99	ND (0.32 J)	120 J	0.55	**2**	10 J	6
602606	TA2-2-TR2-P12-SL6-S	8-23-99	2.5	180 J	0.5	**5.9**	**14**	8.6
602606	TA2-2-TR2-P12-SL6-DU	8-23-99	2.9	190 J	0.5	**5.3**	**13**	7.3
602607	TA2-2-TR2-P12A-SL6-S (off-site laboratory)	8-23-99	2.95	177	0.352 J (0.463)	**5.14 J**	11.5	8.5 J
602607	TA2-2-TR2-P12A-SL6-DU (off-site laboratory)	8-23-99	3.05	192	0.347 J (0.476)	**4.87 J**	9.06	10.3 J
602617	TA2-2-TR1-P6-SL10-S	9-07-99	2.9	200 J	0.58	**5.6**	11	6.6
602784	TA2-2-TR1-P4-SL1-S	10-04-99	3	180 J	0.4	**5.6**	7.8	6.1
602784	TA2-2-TR1-P4-SL2-S	10-04-99	2.7	170 J	0.4	**5.5**	7.8	6.2
602791	TA2-2-TR1-P3-SL2-S	10-18-99	3.1	**210 J**	0.49	**19**	**20**	**12**
602792	TA2-2-TR1-P2-SL3-S	10-20-99	3.3	**310 J**	0.57	**7.5**	**16**	9.5
602796	TA2-2-TRB3-SL16-002-S	10-20-99	2.9	**250 J**	0.45	**4**	11	6.8
602796	TA2-2-TRB3-SL16-003-S	10-20-99	2.8	120 J	0.45	0.9	**13**	6.5
602796	TA2-2-TRB3-SL16-003-D	10-20-99	2.4	120 J	0.38	0.59	6.3	6.9
602796	TA2-2-TRB3-SL16-004-S	10-20-99	2.9	**230 J**	0.48	**3.8**	12	7.2
602796	TA2-2-TRB3-SL16-005-S	10-20-99	3.1	**210 J**	0.46	**2.9**	8.3	8.1
602796	TA2-2-TRC9-SL83-002-S	10-20-99	3.1	200 J	0.44	**4**	12	8.7

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
602796	TA2-2-TRC9-SL83-003-S	10-20-99	3.2	**360 J**	0.45	**2.1**	12	6.9
602796	TA2-2-TRC9-SL83-004-S	10-20-99	3.3	190 J	0.48	**4.3**	**14**	7.8
602796	TA2-2-TRC9-SL83-004-D	10-20-99	3.5	**230 J**	0.48	**2.9**	**14**	7.8
602796	TA2-2-TRC9-SL83-005-S	10-20-99	3.1	**350 J**	0.61	**3**	**13**	10
602804	TA2-2-TR1-P1-SL1-S	11-9-99	2.4	**800 J**	0.39	**4.6**	9.6	9
602800	TA2-2-TR1-P2-SL7-S	10-27-99	2.1 J (2.3)	150 J	0.43	**7.4**	12	8.3
602940	TA2-2-TR2-P8-SL1-S	12-01-99	3.3	130 J	0.47	0.59	**70**	170
602921	TA2-2-TR2-P10-SL1-S	11-19-99	2.2 J (2.4)	140 J	ND (0.28 U)	**9.9**	5.2	7.2
602967	TA2-2-TR2-P9-SL1-S	1-03-00	3.2	190 J	0.42	**17 J**	**23 J**	**14**
602967	TA2-2-TR2-P9-SL1-DU	1-03-00	3	190 J	0.34	**6.4 J**	**14 J**	7.6
602968	TA2-2-TR2-P7-SL1-S	1-03-00	2.6	**380 J**	0.36	**2.5 J**	10	9.6
602968	TA2-2-TR2-P8-SL1-S	1-03-00	3.6	190 J	0.48	**3.8 J**	**21**	**14**
602968	TA2-2-TR2-P8-SL1-DU	1-03-00	3.9	170 J	0.48	**10 J**	**19**	9.7
602968	TA2-2-TR2-P9-SL2-S	1-03-00	3.1	160 J	0.37	**14 J**	**16**	8.3
602970	TA2-2-TR2-P6-SL4-S	1-10-00	2.8	**210**	0.38	**7.6 J**	**34 J**	11
602974	TA2-2-TR2-P543-SL1-S	1-24-00	2.9	**360 J**	0.39	**26**	**35**	**340 J**
602974	TA2-2-TR2-P543-SL1-DU	1-24-00	3.5	**250 J**	0.38	**15**	**18**	**240 J**
602978	TA2-2-TR2-P543-SL4-S	2-08-00	3.6	**320 J**	0.48	**7.4**	**27**	**83 J**
602978	TA2-2-TR2-P543-SL5-S	2-08-00	3	**640 J**	0.37	**8.6**	**21**	**61 J**
603057	TA2-2-TR2-P2/1-SL1-S	2-28-00	3.1	170 J	0.37	**7.1**	**14**	**26**
603057	TA2-2-TR2-P2/1-SL1-DU	2-28-00	3.5	170 J	0.49	**7.6**	**20**	**32**
603057	TA2-2-TR2-P2/1-SL4-S	2-28-00	3.9	270 J	0.45	**5.2**	**26**	**42**
603057	TA2-2-TR3-P2/3-SL2-S	2-28-00	3.1	200 J	0.36	**3.1**	9.5	9.3
603057	TA2-2-TR3-P2/3-SL3-S	2-28-00	3.9	190 J	0.33	**3.3**	**15**	**20**
603068	TA2-2-TR3-P456-SL1-S	3-02-00	3.9	190 J	0.44	**5.3**	**22**	8.3
603068	TA2-2-TR3-P456-SL4-S	3-02-00	3	180 J	0.33	**3.3**	8.8	6.5
603068	TA2-2-TR3-P456-SL5-S	3-02-00	4	**240 J**	0.43	**2.8**	12	11
603068	TA2-2-TR3-P456-SL5-DU	3-02-00	3.6	**210 J**	0.42	**6**	**13**	7.3

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603070	TA2-2-TR3-P456-SL1-S (off-site laboratory)	3-07-00	3.07	**322**	0.368 J (0.51)	**4.65**	10.1	6.26 J
603070	TA2-2-TR3-P456-SL1-DU (off-site laboratory)	3-07-00	2.99	**240**	0.379 J (0.502)	**10.6**	9.22	6.37 J
603070	TA2-2-TR3-P456-SL4-S (off-site laboratory)	3-07-00	2.78	**227**	0.36 J (0.517)	**4.22**	10.1	**11.6 J**
603070	TA2-2-TR3-P456-SL4-DU (off-site laboratory)	3-07-00	3.35	**219**	0.353 J (0.497)	**16.1**	9.94	6.14 J
603070	TA2-2-TR3-P789-SL2-S (off-site laboratory)	3-07-00	3.02	**262**	0.377 J (0.494)	**68.6**	**13**	**77.5 J**
603070	TA2-2-TR3-P789-SL2-DU (off-site laboratory)	3-07-00	2.8	**207**	0.375 J (0.511)	**7.84**	**14.1**	**14.1 J**
603070	TA2-2-TR3-P789-SL3-S (off-site laboratory)	3-07-00	2.89	184	0.345 J (0.506)	**138**	**33.5**	10.3 J
603070	TA2-2-TR3-P789-SL3-DU (off-site laboratory)	3-07-00	2.52	175	0.331 J (0.476)	**6.87**	11.1	10.1 J
603072	TA2-2-TR3-P789-SL2-S	3-14-00	2.5	170 J	0.38	**7**	12	9 J
603072	TA2-2-TR3-P789-SL3-S	3-14-00	3	**220 J**	0.43	**11**	**16**	**15 J**
Overburden Soils								
600071	TA2-2-OVER-0001-SL2-S	4-16-98	2.9	110 J	0.41	0.44	9.7	6.6
600081	TA2-2-OVW4-0001-SL5-S	4-29-98	2.8	190 J	0.4	**2.2**	11	8.3
600083	TA2-2-OVW4-0001-SL8-S	5-04-98	3.4	160 J	0.45	0.56	11	6.6
600083	TA2-2-SLPE-0001-SL3-S	5-04-98	2.6	200 J	0.36	0.15 J (0.16)	7.5	5
600083	TA2-2-SLPE-0001-SL9-S	5-04-98	2.8	140 J	0.38	0.13 J (0.17)	8.6	6.2
600083	TA2-2-SLPE-SL14-000-S	5-04-98	2.7	140 J	0.35	0.68	8.4	5.4
600277	TA2-2-SLPE-SL16-000-S	5-18-98	2 J (2.5)	77 J	0.31	0.12 J (0.17)	5.5	3.4
600277	TA2-2-SLPE-SL19-000-S	5-18-98	2.8	160 J	0.39	0.14 J (0.15)	10	7
600277	TA2-2-SLPE-SL22-000-S	5-18-98	2.7	120 J	0.35	0.12 J (0.16)	9.2	4.8

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
600277	TA2-2-SLPE-SL23-000-S	5-18-98	2.6	160 J	0.28	0.1 J (0.15)	7.8	4
600277	TA2-2-SLPE-SL32-000-S	5-18-98	1.7 J (2.4)	86 J	0.31	0.087 J (0.16)	5.5	3.8
600277	TA2-2-SLPE-SL34-000-S	5-18-98	2.1 J (2.5)	88 J	0.26	0.095 J (0.17)	8.5	4.1
600281	TA2-2-OVTE-SL03-000-S	5-26-98	1.8 J (2.5)	120 J	0.29	0.086 J (0.17)	5.9	3.8
600281	TA2-2-OVTE-SL08-000-S	5-26-98	2.5	120 J	0.42	0.64	6.7	5
600285	TA2-2-OVTE-SL11-000-S	6-01-98	3.8	140 J	0.39	0.14 J (0.17)	7.6	5.4
600285	TA2-2-OVTE-SL11-000-DUP	6-01-98	2.6	140 J	0.32	0.11 J (0.16)	5.3	4.3
600292	TA2-2-OVA5-SL05-000-S	6-10-98	2.6	160 J	0.41	0.14 J (0.15)	9.1	4.8
600292	TA2-2-OVA5-SL11-000-S	6-10-98	3.2	160 J	0.38	0.12 J (0.16)	8.8	4.8
600292	TA2-2-OVA5-SL13-000-S	6-10-98	2.7	170 J	0.33	0.094 J (0.16)	9.2	4.4
600461	TA2-2-OVD1-SL01-000-S	7-07-98	1.5 J (2.4)	110 J	0.25	0.074 J (0.16)	4.6	3.6
600461	TA2-2-OVD1-SL02-000-S	7-07-98	2.5	100 J	0.34	**2**	7.1	5.9
600465	TA2-2-OVD3-SL01-000-S	7-13-98	2 J (2.4)	110 J	0.39	0.13 J (0.16)	11	5.2
600474	TA2-2-OVD4-SL03-000-S	8-17-98	2.5	160 J	0.38	0.16 J (0.17)	10	6.2
600489	TA2-2-OVD7-SL02-000-S	9-14-98	3.2	190 J	0.35	0.28 J	8.1	7
600489	TA2-2-OVD8-SL02-000-S	9-14-98	3	**220 J**	0.29	0.14 J (0.15)	6.6	4.8
600493	TA2-2-SLPE-SL39-000-S	9-21-98	3.4	170 J	0.35	0.16 J	7.6	5.3
600493	TA2-2-SLPE-SL41-000-S	9-21-98	3.1	180 J	0.31	0.18 J	7	4.9
600505	TA2-2-SLPE-SL44-000-S	11-03-98	3.4	180 J	0.38	0.43	7.8	5.8
601726	TA2-2-OVB1-SL01-000-S	4-14-99	3	140 J	0.48	0.27	12	7.1 J
602093	TA2-2-OVA2-SL01-000-S	7-07-99	2.6	190	ND (0.38 U)	0.59	6.8	4.8 J
602093	TA2-2-OVA3-SL01-000-S	7-07-99	2.8	160 J	ND (0.4 U)	0.34	7.2	4.8 J
602099	TA2-2-FILL-DIRT-1/2-S	7-28-99	2.4	160 J	0.43	**1.5**	7.7	5.9
602099	TA2-2-FILL-DIRT-2/2-S	7-28-99	3.1	160 J	0.44	**2**	8.6	6.5
602591	TA2-2-OVA1-SL06-000-S	8-03-99	ND (2.2 U)	180 J	0.43	0.39	7.8 J	8.3
602591	TA2-2-OVT2-P12-SL1-S	8-03-99	ND (2.5 U)	190 J	0.49	0.56	7.5 J	3.7
602591	TA2-2-OVT3-P10-SL1-S	8-03-99	ND (2.2 U)	130 J	0.51	0.46	16 J	5.1
602617	TA2-2-OVT1-P6-SL1-S	9-07-99	3.2	150 J	0.44	0.26	8.4	5.8

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
602784	TA2-2-OVT1-P4-SL1-S	10-04-99	2.4	110	0.3	0.28	4.7	4.3
602791	TA2-2-OVT1-P2-SL1-S	10-18-99	3.4	140 J	0.43	0.25	12	6.7
602791	TA2-2-OVT1-P3-SL1-S	10-18-99	3.3	180 J	0.5	0.57	**13**	5.6
602800	TA2-2-OVT1-P1-SL1-S	10-27-99	2.0 J (2.3)	**290 J**	0.42	0.59	6.8	3.7
602921	TA2-2-OVT2-P10-SL1-S	11-19-99	2.6	160 J	0.6	0.52	7.2	4.6
602922	TA2-2-OVT2-P9-SL1-S	11-15-99	2.3 J (2.4)	110 J	0.52	0.19	8.8	4.6
602940	TA2-2-OVT2-P8-SL1-S	12-01-99	2.7	**240 J**	0.58	**0.94**	11	5.8
602967	TA2-2-OVT2-P6-SL1-S	1-03-00	3.6	170 J	0.48	0.22 J	12 J	6.4
602967	TA2-2-OVT2-P7-SL1-S	1-03-00	2.4	180 J	0.3	0.43 J	7.8 J	4.2
602968	TA2-2-OVT2-P5/1-SL1-S	1-03-00	3.6	170 J	0.43	0.5 J	10	6.7
603057	TA2-2-OVT3-P2/3-SL1-S	2-28-00	3.3	130 J	0.48	0.51	11	5.9
603057	TA2-2-OVT3-P2/3-SL1-DU	2-28-00	4.1	**220 J**	0.54	**1**	9.3	6.6
603057	TA2-2-OVT3-P456-SL1-S	2-28-00	3.5	**230 J**	0.52	0.48	9.5	6.7
603068	TA2-2-OVT3-P789-SL1-S	3-02-00	3.7	200 J	0.55	**1**	**14**	7.3
603068	TA2-2-OVT3-P789-SL2-S	3-02-00	3.2	160 J	0.41	0.39	8.4	5.7
603068	TA2-2-OVT3-P789-SL2-DU	3-02-00	3.5	**310 J**	0.46	**7.1**	**15**	**12**
602606	TA2-2-EAST-FNCE-001-S	8-23-99	3	**290 J**	0.56	**1.8**	**13**	6.4
602606	TA2-2-EAST-FNCE-001-DU	8-23-99	3.2	**210 J**	0.51	**2.1**	12	7.3
602607	TA2-2-TR2-EAST-FNCE-002-S	8-23-99	3.89	**242**	0.528	**1.38 J**	8.21	9.54 J
602607	TA2-2-TR2-EAST-FNCE-002-DU	8-23-99	3.45	**226**	0.389 J (0.459)	**1.85 J**	6.71	8.02 J
Soil Removed Directly from Artifacts (Bin Soils)								
601594	TA2-2-TRC7-C6-BIN-S	3-10-99	2.6	**430**	0.7	**280**	**110**	**230**
601594	TA2-2-TRC8-C/F-BIN-S	3-10-99	2.7	**300**	**4.2**	**710**	**99**	**280**
601594	TA2-2-TRC9-C/F-BIN-S	3-10-99	3	**2500**	0.75	**740**	**89**	**380**
601594	TA2-2-TRD8-C/F-BIN-S	3-10-99	3.9	**590**	**0.9**	**510**	**68**	**360**
602974	TA2-2-P225-2C/F-BIN-S	1-24-00	3.4	**1100 J**	0.47	**320**	**58**	**620 J**
602974	TA2-2-P225-3C/F-BIN-S	1-24-00	2.8	**270 J**	0.58	**250**	**57**	**450 J**
602796	TA2-2-COBL-GRIZ-002-S	10-20-99	2.1 J (2.7)	190 J	0.42	**5.9**	8	7.4

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
602796	TA2-2-COBL-GRIZ-003-S	10-20-99	2.4 J (2.5)	170 J	0.39	**4.4**	9.2	**14**
602796	TA2-2-COBL-GRIZ-004-S	10-20-99	2.5	**2700 J**	0.39	**6.8**	9.5	**24**
602796	TA2-2-COBL-GRIZ-004-D	10-20-99	2.4 J (2.5)	**890 J**	0.37	**5.4**	9.1	9.8
602796	TA2-2-COBL-GRIZ-005-S	10-20-99	2.8	200 J	0.43	**9.8**	8.8	8.5
602600	TA2-2-COBL-GRIZ-TRA-S	8-18-99	ND (0.62 J)	190 J	0.54	**5.7**	10 J	5.9
602600	TA2-2-COBL-GRIZ-TRA-DUP	8-18-99	ND (0.62 J)	110 J	0.38	**4.1**	6.7 J	6.2
603073	TA2-2-1LAY-DOWN-BIN-S	3-09-00	2.2 J (2.5)	140 J	0.41	**4**	**13**	8.6
603073	TA2-2-2LAY-DOWN-BIN-S	3-09-00	**4.6**	**220 J**	0.66	**15**	**19**	**19**
603073	TA2-2-3LAY-DOWN-BIN-S	3-09-00	3.4	**240 J**	0.6	**9.8**	**17**	**16**
603073	TA2-2-4LAY-DOWN-BIN-S	3-09-00	3.1	**250**	0.45	**8.8**	12	10
603073	TA2-2-4LAY-DOWN-BIN-DU	3-09-00	3.2	190 J	0.47	**8.7**	**21**	**19**
603073	TA2-2-5LAY-DOWN-BIN-S	3-09-00	3.3	160 J	0.64	**13**	**13**	**15**
603073	TA2-2-6LAY-DOWN-BIN-S	3-09-00	3.5	**270 J**	0.59	**4.3**	**17**	**34**
603073	TA2-2-7LAY-DOWN-BIN-S	3-09-00	3.3	150 J	0.6	**11**	**16**	**27**
603073	TA2-2-7LAY-DOWN-BIN-DU	3-09-00	3.4	**260 J**	0.62	**10**	**15**	**19**
603073	TA2-2-8LAY-DOWN-BIN-S	3-09-00	2.8	180 J	1	**11**	**36**	**14**
603073	TA2-2-9LAY-DOWN-BIN-S	3-09-00	3.2	180 J	0.6	**21**	**19**	**39**
603077	TA2-2-2LAY-DOWN-BIN-S (off-site laboratory)	3-14-00	2.86	187	0.38 J (0.5)	**8.92 J**	11.3 J	**14.6 J**
603077	TA2-2-6LAY-DOWN-BIN-S (off-site laboratory)	3-14-00	2.9	176	0.372 J (0.5)	**5.34 J**	10.5 J	**27.1 J**
603186	TA2-2-1LAY-DOWN-BIN-E	6-14-00	3.2	160 J	0.45	**8.9 J**	12 J	**16**
603186	TA2-2-1LAY-DOWN-BIN-N	6-14-00	ND (3.1 U)	160 J	0.46	**12 J**	**14 J**	**29**
603186	TA2-2-1LAY-DOWN-BIN-S	6-14-00	3.3	170 J	0.47	**7.8 J**	12 J	**25**
603186	TA2-2-1LAY-DOWN-BIN-W	6-14-00	3.2	170 J	0.44	**13 J**	**17 J**	**12**
603186	TA2-2-1LAY-DOWN-BIN-WDU		ND (2.8 U)	170 J	0.4	**8 J**	**15 J**	**16**
603186	TA2-2-2LAY-DOWN-BIN-E	6-14-00	3.9	**300 J**	0.73	**13 J**	**18 J**	**17**
603186	TA2-2-2LAY-DOWN-BIN-N	6-14-00	3.3	160 J	0.51	**22 J**	**31 J**	**22**

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603186	TA2-2-2LAY-DOWN-BIN-NDU	6-14-00	3.5	**210 J**	0.66	**13 J**	**23 J**	**19**
603186	TA2-2-2LAY-DOWN-BIN-S	6-14-00	3.6	**210 J**	0.68	**11 J**	**27 J**	**380**
603186	TA2-2-2LAY-DOWN-BIN-W	6-14-00	ND (3.1 U)	180 J	0.64	**13 J**	**19 J**	**19**
603186	TA2-2-3LAY-DOWN-BIN-E	6-14-00	3.8	200 J	0.62	**19 J**	**22 J**	**61**
603186	TA2-2-3LAY-DOWN-BIN-EDU	6-14-00	ND (3.1 U)	170 J	0.46	**9.8 J**	**14 J**	**28**
603186	TA2-2-3LAY-DOWN-BIN-N	6-14-00	**4.6**	**230 J**	0.65	**15 J**	**22 J**	**30**
603186	TA2-2-3LAY-DOWN-BIN-S	6-14-00	ND (3.7 U)	**210 J**	**0.9**	**22 J**	**15**	**16**
603186	TA2-2-3LAY-DOWN-BIN-W	6-14-00	ND (4.1 U)	**230 J**	**0.93**	**15 J**	**34**	**22**
603186	TA2-2-4LAY-DOWN-BIN-E	6-14-00	ND (3.5 U)	200 J	0.44	**6.6 J**	**14**	9
603186	TA2-2-4LAY-DOWN-BIN-N	6-14-00	2.7	140	0.42	**8.4**	**13**	**12**
603186	TA2-2-4LAY-DOWN-BIN-S	6-14-00	ND (2.9 U)	140 J	0.43	**5.4 J**	11	**12**
603186	TA2-2-4LAY-DOWN-BIN-SDU	6-14-00	ND (3.1 U)	**8100 J**	0.44	**66 J**	**460**	**22**
603186	TA2-2-4LAY-DOWN-BIN-W	6-14-00	ND (2.6 U)	160 J	0.34	**6.2 J**	11	7.9
603186	TA2-2-5LAY-DOWN-BIN-E	6-14-00	ND (3.2 U)	160 J	0.47	**6.1 J**	**13**	**16**
603186	TA2-2-5LAY-DOWN-BIN-N	6-14-00	ND (2.8 U)	150 J	0.48	**16 J**	**15**	**15**
603186	TA2-2-5LAY-DOWN-BIN-NDU	6-14-00	ND (3.5 U)	150 J	0.48	**8.4 J**	**15**	**19**
603186	TA2-2-5LAY-DOWN-BIN-S	6-14-00	ND (2.5 U)	160 J	0.7	**36 J**	**15**	**36**
603186	TA2-2-5LAY-DOWN-BIN-W	6-14-00	ND (3.3 U)	200 J	0.59	**14 J**	**18**	**17**
603186	TA2-2-6LAY-DOWN-BIN-E	6-14-00	3.2	200 J	0.59	**9.1 J**	12 J	**16**
603186	TA2-2-6LAY-DOWN-BIN-EDU	6-14-00	2 J (2.4)	**240 J**	0.57	**7.2 J**	**16 J**	**21**
603186	TA2-2-6LAY-DOWN-BIN-N	6-14-00	ND (3 U)	130 J	0.37	**3.4 J**	11	6.6
603186	TA2-2-6LAY-DOWN-BIN-S	6-14-00	2.6	**210 J**	0.54	**5.7 J**	**16 J**	**27**
603186	TA2-2-6LAY-DOWN-BIN-W	6-14-00	2.8	180 J	0.65	**5 J**	**15 J**	**46**
603186	TA2-2-7LAY-DOWN-BIN-E	6-14-00	3.1	**240 J**	0.69	**13 J**	**21 J**	**27**
603186	TA2-2-7LAY-DOWN-BIN-N	6-14-00	2.2	190 J	0.67	**9.9 J**	**16 J**	**20**
603186	TA2-2-7LAY-DOWN-BIN-S	6-14-00	3.5	**1700 J**	0.56	**22 J**	**170 J**	**24**
603186	TA2-2-7LAY-DOWN-BIN-SDU	6-14-00	2.9	200 J	0.54	**24 J**	**21 J**	**19**
603186	TA2-2-7LAY-DOWN-BIN-W	6-14-00	2.9	200 J	0.65	**20 J**	**20 J**	**21**

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603186	TA2-2-8LAY-DOWN-BIN-E	6-14-00	2.7	**240 J**	0.76	**23 J**	**18 J**	**22**
603186	TA2-2-8LAY-DOWN-BIN-N	6-14-00	2.4	140 J	0.5	**7.3 J**	**15 J**	**15**
603186	TA2-2-8LAY-DOWN-BIN-S	6-14-00	2 J (2.4)	160 J	0.51	**10 J**	**18 J**	**16**
603186	TA2-2-8LAY-DOWN-BIN-W	6-14-00	3.1	190 J	0.65	**9.4 J**	**16 J**	**27**
603186	TA2-2-8LAY-DOWN-BIN-WDU	6-14-00	3.6	**620 J**	0.[illegible]	**11**	**62 J**	**32 J**
603186	TA2-2-9LAY-DOWN-BIN-E	6-14-00	3.8	**210 J**	**0.83**	**13**	**19 J**	**27 J**
603186	TA2-2-9LAY-DOWN-BIN-N	6-14-00	3.5	**230 J**	0.51	**23**	**26 J**	**86 J**
603186	TA2-2-9LAY-DOWN-BIN-NDU	6-14-00	2.3 J (2.4)	**220 J**	0.66	**13**	**14 J**	**19 J**
603186	TA2-2-9LAY-DOWN-BIN-S	6-14-00	2.6	180 J	0.5	**10**	**16 J**	**29 J**
603186	TA2-2-9LAY-DOWN-BIN-W	6-14-00	3	**210 J**	0.59	**8.4**	**16 J**	**15 J**
603192	TA2-2-PIT-BURM-MIX-E-S	6-21-00	2.4	**220 J**	0.54	**1.1**	11 J	6.7 J
603193	TA2-2-PIT-BURM-MIX-E-S (off-site laboratory split)	6-21-00	3.38	**254**	0.349 J (0.485)	**1.36 J**	6.74	6.05
603192	TA2-2-PIT-BURM-MIX-N-S	6-21-00	2.7	180 J	0.53	**1.1**	9.5 J	6.8 J
603193	TA2-2-PIT-BURM-MIX-N-S (off-site laboratory split)	6-21-00	3.3	**270**	0.38 J (0.49)	**2.45 J**	6.67	6.95
603193	TA2-2-PIT-BURM-MIX-N-DU (off-site laboratory split)	6-21-00	3.05	**232**	0.326 J (0.5)	**1.79 J**	6.16	5.94
603192	TA2-2-PIT-BURM-MIX-S-S	6-21-00	1.2 J (2.4)	110 J	0.31	0.28	6.1 J	3.9 J
603193	TA2-2-PIT-BURM-MIX-S-S (off-site laboratory split)	6-21-00	3	**223**	0.331 J (0.5)	**1.2 J**	5.95	5.52
603192	TA2-2-PIT-BURM-MIX-W-S	6-21-00	2.5	190 J	0.47	**1.1**	10 J	5.7 J
603192	TA2-2-PIT-BURM-MIX-W-DU	6-21-00	1.8 J (2.4)	140 J	0.36	0.73	6.3 J	6.2 J
603193	TA2-2-PIT-BURM-MIX-W-S (off-site laboratory split)	6-21-00	3.21	**258**	0.345 J (0.49)	**1.41 J**	6.35	6.89
603197	TA2-2-CWLF-COBL-GRZ-1	6-26-00	3.3	170 J	0.46	**9.5**	**21**	9.5
603196	TA2-2-CWLF-COBL-GRZ-1 (off-site laboratory split)	6-26-00	3.73	**215**	0.48 J (0.499)	**13.2 J**	**13.9**	10.4

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603197	TA2-2-CWLF-COBL-GRZ-2	6-26-00	3.2	**210 J**	0.63	**5.7**	**18**	11
603196	TA2-2-CWLF-COBL-GRZ-2 (off-site laboratory split)	6-26-00	3.18	186	0.53	**7.28 J**	9.02	9.89
603197	TA2-2-CWLF-COBL-GRZ-3	6-26-00	2.8	**460 J**	0.52	**17**	**20**	**16**
603196	TA2-2-CWLF-COBL-GRZ-3 (off-site laboratory split)	6-26-00	3.48	**221**	0.4 J (0.498)	**5.09 J**	9.3	**13.2**
603197	TA2-2-CWLF-COBL-GRZ-4	6-26-00	3.2	**250 J**	0.58	**20**	**14**	**12**
603197	TA2-2-CWLF-COBL-GRZ-4DU	6-26-00	2.9	160 J	0.48	**3.3**	**13**	8.8
603196	TA2-2-CWLF-COBL-GRZ-4 (off-site laboratory split)	6-26-00	3.47	189	0.37 J (0.498)	**5.28 J**	8.57	10.7
603196	TA2-2-CWLF-COBL-GRZ-4DU (off-site laboratory split)	6-26-00	3.99	191	0.394 J (0.495)	**3.95 J**	9.68	9.49
603197	TA2-2-CWLF-COBL-GRZ-5	6-26-00	2.8	**220 J**	0.57	**5**	**16 J**	**12**
603196	TA2-2-CWLF-COBL-GRZ-5 (off-site laboratory split)	6-26-00	3.29	197	0.422 J (0.497)	**4.69 J**	10	**12.5**
603197	TA2-2-CWLF-COBL-GRZ-6	6-26-00	2.8	**500 J**	0.52	**4.5**	**17**	**23**
603196	TA2-2-CWLF-COBL-GRZ-6 (off-site laboratory split)	6-26-00	3.24	190	0.379 J (0.498)	**5.29 J**	10.2	**24.4**
603197	TA2-2-CWLF-COBL-GRZ-7	6-26-00	2.7	**240 J**	0.62	**4.7**	**17**	11
603196	TA2-2-CWLF-COBL-GRZ-7 (off-site laboratory split)	6-26-00	3.45	193	0.526	**4.77 J**	10.3	9.42
603197	TA2-2-CWLF-COBL-GRZ-8	6-26-00	2.6	200 J	0.57	**5.1**	**15**	10
603197	TA2-2-CWLF-COBL-GRZ-8DU	6-26-00	3.1	**260 J**	0.59	**7.2**	**18**	**12**
603196	TA2-2-CWLF-COBL-GRZ-8 (off-site laboratory split)	6-26-00	3.5	**240**	0.478 J (0.5)	**36.1 J**	9.88	10.6
603196	TA2-2-CWLF-COBL-GRZ-8DU (off-site laboratory split)	6-26-00	3.7	199	0.46 J (0.499)	**5.75 J**	10.4	**12.4**
603197	TA2-2-CWLF-COBL-GRZ-9	6-26-00	2.8	**220 J**	0.7	**5.8**	**17**	**14**

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603196	TA2-2-CWLF-COBL-GRZ-9 (off-site laboratory split)	6-26-00	3.6	177	0.439 J (0.497)	**4.57 J**	8.81	11.7
603197	TA2-2-CYLI-NDER-BRM-S	6-26-00	3	160 J	0.48	**5.2**	12	11
603196	TA2-2-CYLI-NDER-BRM-S (off-site laboratory split)	6-26-00	3.58	**228**	0.371 J (0.5)	**5.85 J**	9.25	**12**
Borrow Area Soils Used to Backfill ACF- and W-Pits								
600003	TA2-2-BORROW-1	3-05-98	**4.6**	**210 J**	0.45	ND (0.16 U)	9.9	8.2
600003	TA2-2-BORROW-2	3-05-98	**4.8**	170 J	0.45	ND (0.28 U)	8.8	**22**
Background Soil Concentrations—North Area[d]			4.4	200	0.8	0.9	12.8	11.2
Quality Assurance/Quality Control Samples (mg/L)								
600059	TA2-2-PTW1-EB (off-site laboratory)	4-06-98	NA	0.000332	0.000223	0.000208	0.000729	0.000678
600283	TA2-2-TRE5-0001-EB (off-site laboratory)	6-01-98	ND (0.00293)	0.00118	ND (0.00022)	0.00041 J	0.00226 J	ND (0.00068)
600459	TA2-2-TRD1-0006-EB (off-site laboratory)	7-06-98	ND (0.00293)	0.00102 J	ND (0.00022)	ND (0.00021)	ND (0.00073)	ND (0.00068)
600472	TA2-2-TRD6-0015-EB (off-site laboratory)	8-11-98	ND (0.00293)	0.00309 J	ND (0.00022)	0.00036 J	0.00151 J	ND (0.00068)
600494	TA2-2-TRD8-0025-EB (off-site laboratory)	9-21-98	ND (0.00451)	0.0009 J	ND (0.00026)	0.00046 J	0.00075 J	ND (0.00159)
601139	TA2-2-TRC7-0003-000-EB (off-site laboratory)	11-30-98	ND (0.00451)	0.00101 J	ND (0.00026)	ND (0.00044)	0.00066 J	ND (0.00159)

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
Soil Excavated from Pits and Trenches							
600046	TA2-2-ACF1-0001-SL2-S	4-01-98	**0.25 J (0.83)**	16 J	NA	NA	NA
600066	TA2-2-ACF2-0001-SL4-S	4-13-98	**0.21**	13	NA	ND (0.041 J)	NA
600039	TA2-2-ACF3-0001-SLI-SU	3-23-98	ND (0.04)	9	NA	NA	NA
600039	TA2-2-ACF4-0001-SLI-SU	3-24-98	**0.18**	15	NA	NA	NA
600048	TA2-2-ACF4-0001-SL5-S	4-02-98	**0.29**	**33 J**	NA	NA	NA
600461	TA2-2-ACF5-SL06-000-S	7-07-98	ND (0.042)	6.9	0.51 J (1.3)	ND (0.042)	0.89
600061	TA2-2-PW12-0001-SL7-S	4-07-98	**0.64 J**	11	NA	NA	NA
600061	TA2-2-PW12-0001-SL8-S	4-07-98	**0.88 J**	12	NA	NA	NA
600069	TA2-2-PTW3-0001-SL4-S	4-14-98	**5.9 J**	14	0.39 J (1.2)	**3 J**	NA
600076	TA2-2-PTW4-SL14-000-S	4-24-98	**1.1**	**28**	0.42 J (1.2)	0.88 J	NA
600085	TA2-2-TRE1-SL06-000-S	5-06-98	0.047 J (0.16)	8	0.44 J (1.2)	0.54	NA
600085	TA2-2-TRE1-SL13-000-S	5-06-98	0.056 J (0.15)	8.1 J	0.43 J (1.2)	0.069 J (0.15)	NA
600087	TA2-2-TRE2-SL07-000-S	5-11-98	0.041 J (0.16)	7.9 J	0.54 J (1.2)	0.07 J (0.16)	NA
600279	TA2-2-TRE3-SL07-000-S	5-21-98	ND (0.041 J)	10	0.42 J (1.2)	ND (0.041 J)	NA
600279	TA2-2-TRE4-SL10-000-S	5-21-98	ND (0.04)	7.4	0.63 J (1.2)	ND (0.04 J)	NA
600285	TA2-2-TRE5-SL17-000-S	6-01-98	0.039 J (0.15)	7.4	0.65 J (1.2)	ND (0.038)	NA
600285	TA2-2-TRE5-SL08-000-S	6-01-98	0.056 J (0.17)	6.6	0.72 J (1.2)	ND (0.042)	NA
600288	TA2-2-TRE6-SL09-000-S (off-site laboratory)	6-08-98	ND (0.0173 J)	8.44	ND (0.07)	ND (0.467 J)	NA
600290	TA2-2-TRE6-SL09-000-S	6-08-98	ND (0.041)	8.3	0.75 J (1.2)	ND (0.041)	NA
600290	TA2-2-TRE6-SL22-000-S	6-08-98	ND (0.04)	7.6	0.91 J (1.2)	0.057 J (0.16)	NA
600290	TA2-2-TRE6-SL22-000-DUP	6-08-98	0.073 J (0.17)	7.4	0.77 J (1.3)	ND (0.044)	NA
600296	TA2-2-TRE7-SL08-000-S	6-17-98	ND (0.039 J)	6.7	0.64 J (1.2)	ND (0.039)	NA
600296	TA2-2-TRE7-SL13-000-S	6-17-98	ND (0.042 J)	7.8	0.82 J (1.3)	0.045 J (0.17)	NA
600296	TA2-2-TRE7-SL25-000-S	6-17-98	ND (0.042 J)	7.7	0.63 J (1.3)	ND (0.042)	NA
600299	TA2-2-TRE7-SL37-000-S	6-23-98	ND (0.043)	6.9	0.55 J (1.3)	0.38	0.94
600299	TA2-2-TRE7-SL49-000-S	6-23-98	ND (0.042)	5.4	0.44 J (1.3)	ND (0.042)	0.77

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
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Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
600299	TA2-2-TRE7-SL55-000-S	6-23-98	ND (0.042)	6.1	0.48 J (1.3)	0.06 J (0.17)	0.71
600301	TA2-2-TRE8-SL01-000-S	6-25-98	ND (0.044)	7.8	0.54 J (1.3)	ND (0.044)	0.92
600301	TA2-2-TRE8-SL14-000-S	6-25-98	ND (0.041)	6.5	0.46 J (1.2)	0.05 J (0.16)	0.79
600303	TA2-2-TRE8-SL07-000-S	6-29-98	0.048 J (0.17)	7.9	0.55 J (1.2)	ND (0.042)	1.62
600303	TA2-2-TRE8-SL21-000-S	6-29-98	0.046 J (0.17)	7.9	0.51 J (1.3)	ND (0.043)	1.05
600303	TA2-2-TRE8-SL29-000-S	6-29-98	0.062 J (0.15)	6.8	0.5 J (1.1)	ND (0.038)	0.94
600463	TA2-2-TRD1-SL02-000-S	7-07-98	0.048 J (0.17)	6.2	0.5 J (1.3)	ND (0.043)	0.76
600463	TA2-2-TRD1-SL06-000-S	7-07-98	ND (0.042)	6.7	0.48 J (1.3)	ND (0.042)	1.13
600463	TA2-2-TRD1-SL09-000-S	7-07-98	0.079 J (0.15)	7	0.49 J (1.2)	ND (0.039)	0.77
600463	TA2-2-TRD1-SL12-000-S	7-07-98	0.05 J (0.17)	6.6	0.54 J (1.3)	ND (0.042)	0.68
600465	TA2-2-TRD2-SL01-000-S	7-13-98	0.048 J (0.16)	8.6	0.57 J (1.2)	ND (0.04)	0.89
600465	TA2-2-TRD2-SL05-000-S	7-13-98	0.048 J (0.17)	7.5	0.5 J (1.3)	ND (0.043)	0.87
600467	TA2-2-TRD3-SL03-000-S	7-20-98	0.076 J (0.17)	8.5	0.61 J (1.2)	ND (0.042)	2.4
600467	TA2-2-TRD3-SL06-000-S	7-20-98	0.054 J (0.16)	8.5	0.53 J (1.2)	ND (0.041)	0.87
600467	TA2-2-TRD3-SL12-000-S	7-20-98	0.076 J (0.17)	9.4	0.43 J (1.3)	**2.2**	0.94
600470	TA2-2-TRD4-SL03-000-S	8-10-98	0.061 J (0.16)	7.4	0.6 J (1.2)	0.13 J (0.16)	0.94
600470	TA2-2-TRD4-SL03-000-DUP	8-10-98	0.056 J (0.17)	7.4	0.58 J (1.2)	ND (0.042)	0.84
600470	TA2-2-TRD4-SL07-000-S	8-10-98	**0.15 J (0.17)**	7.7	0.51 J (1.3)	0.044 J (0.17)	0.8
600470	TA2-2-TRD4-SL14-000-S	8-10-98	0.046 J (0.16)	7.7	0.47 J (1.2)	0.054 J (0.16)	0.99
600470	TA2-2-TRD5-SL05-000-S	8-10-98	**0.14 J (0.16)**	6.7	0.4 J (1.2)	ND (0.041)	0.61
600470	TA2-2-TRD5-SL05-000-DUP	8-10-98	ND (0.045)	9.2	0.38 J (1.3)	ND (0.045)	0.86
600474	TA2-2-TRD6-SL03-000-S	8-17-98	**0.21**	7.7	0.59 J (1.3)	0.089 J (0.17)	0.95
600474	TA2-2-TRD6-SL08-000-S	8-17-98	**0.12 J (0.18)**	6.5	0.42 J (1.3)	0.15 J (0.18)	0.81
600474	TA2-2-TRD6-SL15-000-S	8-17-98	**0.14 J (0.17)**	6.5	0.52 J (1.3)	0.14 J (0.17)	0.65
600474	TA2-2-TRD6-SL19-000-S	8-17-98	**0.11 J (0.17)**	8.1	0.64 J (1.3)	0.076 J (0.17)	0.8
600474	TA2-2-TRD6-SL23-000-S	8-17-98	**0.11 J (0.16)**	6.5	0.41 J (1.2)	0.11 J (0.16)	0.63
600489	TA2-2-TRD7-SL03-000-S	9-14-98	ND (0.04 J)	8.4	0.58 J (1.2)	0.049 J (0.16)	0.77
600489	TA2-2-TRD7-SL03-000-DUP	9-14-98	**0.14 J (0.19)**	9.3	0.7 J (1.4)	0.063 J (0.19)	0.89

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
600489	TA2-2-TRD7-SL11-000-S	9-14-98	ND (0.046 J)	8.7	0.64 J (1.4)	0.11 J (0.18)	0.84
600489	TA2-2-TRD7-SL13-000-S	9-14-98	ND (0.038 J)	8.4	0.65 J (1.2)	0.1 J (0.15)	1.1
600489	TA2-2-TRD7-SL23-000-S	9-14-98	ND (0.042 J)	8.7	0.57 J (1.3)	0.058 J (0.17)	0.87
600502	TA2-2-TRD8-SL01-049-S	10-20-98	**0.6**	12	0.43 J (1.2)	0.13 J (0.16)	0.84
600502	TA2-2-TRD8-SL01-049-DUP	10-20-98	**0.76**	13	0.71 J (1.3)	0.32	1.6
600502	TA2-2-TRD8-SL04-000-S	10-20-98	**0.85**	10	0.56 J (1.3)	0.17 J (0.17)	0.86
600502	TA2-2-TRD8-SL16-000-S	10-20-98	**0.48**	14	0.57 J (1.3)	0.13 J (0.17)	0.9
600502	TA2-2-TRD8-SL27-000-S	10-20-98	**0.69**	12	0.64 J (1.3)	0.18	0.8
600502	TA2-2-TRD8-SL33-000-S	10-20-98	**0.7**	12	0.54 J (1.2)	0.12 J (0.16)	0.87
600502	TA2-2-TRD8-SL45-000-S	10-20-98	**0.81**	14	0.58 J (1.3)	0.15 J (0.18)	1.1
600505	TA2-2-TRC9-SL01-000-S	11-03-98	**0.42**	21	0.69 J (1.1)	0.98	0.96
600505	TA2-2-TRC9-SL05-000-S	11-03-98	**0.5**	**28**	0.67 J (1.3)	0.95	0.67
600505	TA2-2-TRC9-SL19-000-S	11-03-98	**0.56**	11	0.71 J (1.3)	0.31	0.88
601134	TA2-2-TRC9-SL24-000-S	11-17-98	**0.46**	13	0.6 J (1.2)	0.38	1.5
601134	TA2-2-TRC9-SL42-000-S	11-17-98	**0.33**	9.8	0.61 J (1.2)	0.11 J (0.16)	1.1
601134	TA2-2-TRC9-SL57-000-S	11-17-98	**0.37**	8.8	0.64 J (1.3)	0.18	0.85
601134	TA2-2-TRC9-SL71-000-S	11-17-98	**0.3**	8.6	0.56 J (1.3)	0.38	0.72
601143	TA2-2-TRC7-SL01-000-S	1-14-99	**0.65**	11	0.71 J (1.2)	0.88	0.74
601143	TA2-2-TRC7-SL21-000-S	1-14-99	**0.27**	15	0.86 J (1.1)	0.31	0.99
601143	TA2-2-TRC8-SL04-000-S	1-14-99	**0.81**	19	0.91 J (1.3)	**2.3**	0.76
601143	TA2-2-TRC8-SL11-000-S	1-14-99	**0.92**	24	**1.1 J (1.3)**	**3.3**	0.94
601143	TA2-2-TRC8-SL17-000-S	1-14-99	**1.8**	23	0.84 J (1.2)	**2.4**	0.94
601143	TA2-2-TRC9-SL83-000-S	1-14-99	**0.23**	8.2	0.76 J (1.2)	**1**	1.2
601145	TA2-2-TRC6-SL07-000-S	1-21-99	**0.2**	12	0.88 J (1.2)	0.97	1.8
601154	TA2-2-TRC5-SL07-000-S	2-01-99	**0.4 J**	10	0.9 J (1.2)	0.39	1.5
601596	TA2-2-TRC3-SL04-000-S	3-11-99	**2.7**	7	0.62 J (1.2)	0.055 J (0.16)	0.55
601596	TA2-2-TRC4-SL08-000-S	3-10-99	**0.21**	6.1	0.46 J (1.2)	0.049 J (0.16)	0.62
601601	TA2-2-TRC3-SL12-000-S	3-29-99	**0.4 J**	12	0.68 J (1.1)	0.39	0.94

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
601603	TA2-2-TRC2-SL02-000-S	4-07-99	ND (0.042 J)	8.1	0.62 J (1.3)	0.096 J (0.17)	1.2
601605	TA2-2-TRC1-SL06-000-S	4-08-99	ND (0.043 J)	8	0.56 J (1.3)	0.2	1
601607	TA2-2-TRB1-SL03-000-S	4-13-99	**23 J**	9.3	0.64 J (1.3)	0.12 J (0.17)	1.2
601728	TA2-2-TRB2-SL01-000-S	4-21-99	**0.19 J**	7.7	**38**	0.1 J (0.17)	0.99
601731	TA2-2-TRB3-SL01-000-S	4-27-99	**0.11 J (0.16)**	12	0.74 J (1.2)	0.043 J (0.16)	0.92
601743	TA2-2-TRB3-SL16-000-S	6-07-99	**0.72 J**	13 J	**250 J**	0.15 J (0.16)	1
602082	TA2-2-TRA3-SL02-000-S	6-17-99	**0.32 J**	9.1	ND (0.28 J)	0.05 J (0.15)	1.1
602088	TA2-2-TRA3-SL07-000-S	6-28-99	**0.64 J**	12	ND (0.3 J)	0.14 J (0.16)	1.2
602093	TA2-2-TRA2-SL06-000-S	7-07-99	**1.1**	10	**1.2**	ND (0.038 J)	0.92
602099	TA2-2-TRA1-SL01-000-S	7-28-99	**0.9 J**	7.6	**1.1 J (1.2)**	ND (0.042)	**4.5**
602597	TA2-2-TR3-P10-SL1-S	8-18-99	**0.45**	11	ND (0.32 J)	0.15 J (0.17)	0.94
602606	TA2-2-TR2-P12-SL6-S	8-23-99	**1.1 J**	15	**1.1**	0.22	1.3
602606	TA2-2-TR2-P12-SL6-DU	8-23-99	**1 J**	14	**1.2**	**1.4**	1.8
602607	TA2-2-TR2-P12A-SL6-S (off-site laboratory)	8-23-99	**1.12**	10.4 J	ND (0.25)	**64 J**	2.17
602607	TA2-2-TR2-P12A-SL6-DU (off-site laboratory)	8-23-99	**1.32**	11.1 J	ND (0.257)	0.435 J (0.476)	1.66
602617	TA2-2-TR1-P6-SL10-S	9-07-99	**0.26**	8.4	0.98 J (1.2)	0.083 J (0.16)	1.1
602784	TA2-2-TR1-P4-SL1-S	10-04-99	**0.8**	**230**	0.64 J (1.2)	0.11 J (0.16)	0.78
602784	TA2-2-TR1-P4-SL2-S	10-04-99	**1.2**	**130**	0.6 J (1.2)	**6.3**	0.77
602791	TA2-2-TR1-P3-SL2-S	10-18-99	**2.1**	**43**	0.5 J (1.1)	0.24	1.1
602792	TA2-2-TR1-P2-SL3-S	10-20-99	**1.0**	17	0.8 J (1.3)	0.38	1.2
602796	TA2-2-TRB3-SL16-002-S	10-20-99	**0.32**	16	0.82 J (1.2)	0.1 J (0.16)	1
602796	TA2-2-TRB3-SL16-003-S	10-20-99	**0.29**	8.9	0.72 J (1.2)	0.36	1.5
602796	TA2-2-TRB3-SL16-003-D	10-20-99	**0.32**	7.6	0.4 J (1.1)	0.087 J (0.15)	0.81
602796	TA2-2-TRB3-SL16-004-S	10-20-99	**0.94**	10	**1 J (1.2)**	0.31	1.4
602796	TA2-2-TRB3-SL16-005-S	10-20-99	**0.27**	8.9	0.79 J (1.1)	0.073 J (0.15)	1.3
602796	TA2-2-TRC9-SL83-002-S	10-20-99	**0.25**	12	0.65 J (1.3)	0.38	1.2

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
602796	TA2-2-TRC9-SL83-003-S	10-20-99	**0.2**	11	0.58 J (1.1)	0.33	1.1
602796	TA2-2-TRC9-SL83-004-S	10-20-99	**0.24**	14	0.58 J (1.2)	0.24	0.91
602796	TA2-2-TRC9-SL83-004-D	10-20-99	**0.26**	12	0.5 J (1.1)	0.24	0.96
602796	TA2-2-TRC9-SL83-005-S	10-20-99	**0.27**	12	0.56 J (1.3)	0.6	0.98
602804	TA2-2-TR1-P1-SL1-S	11-9-99	**0.17**	10	0.91 J (1.2)	0.23	0.8
602800	TA2-2-TR1-P2-SL7-S	10-27-99	**0.52**	13	ND (0.29 J)	0.59	0.85
602940	TA2-2-TR2-P8-SL1-S	12-01-99	**1.4**	7.2	ND (0.3 J)	0.2	0.57
602921	TA2-2-TR2-P10-SL1-S	11-19-99	0.064 J (0.16)	9.1	ND (0.3 J)	0.041 J (0.16)	1.3
602967	TA2-2-TR2-P9-SL1-S	1-03-00	**0.25**	16 J	0.88 J (1.1)	**1.8**	1.4
602967	TA2-2-TR2-P9-SL1-DU	1-03-00	**0.21**	9.7 J	**1.3**	0.14 J (0.15)	0.85
602968	TA2-2-TR2-P7-SL1-S	1-03-00	**0.3 J**	9.4	0.74 J (1.1)	0.11 J (0.15)	0.89
602968	TA2-2-TR2-P8-SL1-S	1-03-00	**0.79 J**	12	0.78 J (1.2)	0.26	1.0
602968	TA2-2-TR2-P8-SL1-DU	1-03-00	**0.58 J**	17	0.92 J (1.2)	0.35	1.0
602968	TA2-2-TR2-P9-SL2-S	1-03-00	**2 J**	23	0.65 J (1.2)	0.36	0.78
602970	TA2-2-TR2-P6-SL4-S	1-10-00	**6.6**	14 J	**1.2**	0.18	0.98
602974	TA2-2-TR2-P543-SL1-S	1-24-00	**6.8 J**	**30**	0.71 J (1.2)	0.57	1.1
602974	TA2-2-TR2-P543-SL1-DU	1-24-00	**6.7 J**	10	0.72 J (1.2)	0.53	1.2
602978	TA2-2-TR2-P543-SL4-S	2-08-00	**4.8 J**	12	0.8 J (1.2)	0.65	1.2
602978	TA2-2-TR2-P543-SL5-S	2-08-00	**1.3 J**	9.9	0.71 J (1.2)	0.68	0.94
603057	TA2-2-TR2-P2/1-SL1-S	2-28-00	**0.71**	10	0.42 J (1.2)	0.18	0.84
603057	TA2-2-TR2-P2/1-SL1-DU	2-28-00	**0.68**	16	0.73 J (1.1)	0.18	1.5
603057	TA2-2-TR2-P2/1-SL4-S	2-28-00	**1.2**	12	0.76 J (1.2)	0.26	1.4
603057	TA2-2-TR3-P2/3-SL2-S	2-28-00	**1.9**	10	0.52 J (1.2)	0.43	0.87
603057	TA2-2-TR3-P2/3-SL3-S	2-28-00	**0.81**	9.9	0.44 J (1.2)	0.28	1
603068	TA2-2-TR3-P456-SL1-S	3-02-00	**2.2**	17	0.46 J (1.2)	**1.1**	1.2
603068	TA2-2-TR3-P456-SL4-S	3-02-00	**0.57**	8.6	0.37 J (1.2)	**1.1**	1.2
603068	TA2-2-TR3-P456-SL5-S	3-02-00	**0.76**	9.7	0.6 J (1.2)	**1.1**	1.3
603068	TA2-2-TR3-P456-SL5-DU	3-02-00	**1.4**	9.5	0.56 J (1.2)	**1.2**	1.2

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603070	TA2-2-TR3-P456-SL1-S (off-site laboratory)	3-07-00	**0.811 J**	8.69	0.569 J	**7.14 J**	1.13
603070	TA2-2-TR3-P456-SL1-DU (off-site laboratory)	3-07-00	**1.01 J**	7.89	0.508 J	**1.62 J**	1.14
603070	TA2-2-TR3-P456-SL4-S (off-site laboratory)	3-07-00	**0.732 J**	7.52	0.585 J	**1.16 J**	1.08
603070	TA2-2-TR3-P456-SL4-DU (off-site laboratory)	3-07-00	**1.05 J**	8.36	0.773 J	**1.5 J**	2.03
603070	TA2-2-TR3-P789-SL2-S (off-site laboratory)	3-07-00	**2.05 J**	11.2	0.664 J	0.931 J	1.33
603070	TA2-2-TR3-P789-SL2-DU (off-site laboratory)	3-07-00	**1.86 J**	12.7	0.76 J	**1.36 J**	1.05
603070	TA2-2-TR3-P789-SL3-S (off-site laboratory)	3-07-00	**6.31 J**	16.7	0.694 J	0.783 J	1.25
603070	TA2-2-TR3-P789-SL3-DU (off-site laboratory)	3-07-00	**25.3 J**	10.5	0.71 J	0.714 J	1.09
603072	TA2-2-TR3-P789-SL2-S	3-14-00	**2.3 J**	11	0.49 J (1.2)	0.77	0.85
603072	TA2-2-TR3-P789-SL3-S	3-14-00	**12 J**	15	0.5 J (1.2)	0.89	1.1
Overburden Soils							
600071	TA2-2-OVER-0001-SL2-S	4-16-98	**0.35**	8.4	0.4 J (1.2)	0.081 J (0.16)	NA
600081	TA2-2-OVW4-0001-SL5-S	4-29-98	**0.34**	11	0.33 J (1.2)	0.35 J	NA
600083	TA2-2-OVW4-0001-SL8-S	5-04-98	**0.15 J (0.17)**	9.6	0.62 J (1.3)	0.19	NA
600083	TA2-2-SLPE-0001-SL3-S	5-04-98	ND (0.041)	7.3	0.54 J (1.2)	0.045 J (0.16)	NA
600083	TA2-2-SLPE-0001-SL9-S	5-04-98	ND (0.042)	7.7	0.48 J (1.3)	ND (0.042)	NA
600083	TA2-2-SLPE-SL14-000-S	5-04-98	ND (0.043)	7.3	0.56 J (1.3)	0.21	NA
600277	TA2-2-SLPE-SL16-000-S	5-18-98	ND (0.042)	5.4	0.46 J (1.3)	ND (0.042 J)	NA
600277	TA2-2-SLPE-SL19-000-S	5-18-98	ND (0.038)	7.5	0.58 J (1.1)	ND (0.038 J)	NA
600277	TA2-2-SLPE-SL22-000-S	5-18-98	ND (0.039)	7.6	0.38 J (1.2)	ND (0.039 J)	NA

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
600277	TA2-2-SLPE-SL23-000-S	5-18-98	ND (0.038)	5.9	0.58 J (1.1)	ND (0.038 J)	NA
600277	TA2-2-SLPE-SL32-000-S	5-18-98	ND (0.041)	4.8	0.37 J (1.2)	ND (0.041 J)	NA
600277	TA2-2-SLPE-SL34-000-S	5-18-98	ND (0.042)	6.3	0.44 J (1.2)	ND (0.042 J)	NA
600281	TA2-2-OVTE-SL03-000-S	5-26-98	ND (0.042)	5	0.4 J (1.2)	ND (0.042 J)	NA
600281	TA2-2-OVTE-SL08-000-S	5-26-98	ND (0.04)	6.8	0.46 J (1.2)	ND (0.04 J)	NA
600285	TA2-2-OVTE-SL11-000-S	6-01-98	ND (0.043)	7.6	0.85 J (1.3)	ND (0.043)	NA
600285	TA2-2-OVTE-SL11-000-DUP	6-01-98	ND (0.041)	7	**1 J (1.2)**	ND (0.041)	NA
600292	TA2-2-OVA5-SL05-000-S	6-10-98	ND (0.037)	7.2	0.82 J (1.1)	ND (0.037)	NA
600292	TA2-2-OVA5-SL11-000-S	6-10-98	ND (0.039)	7	0.77 J (1.2)	ND (0.039)	NA
600292	TA2-2-OVA5-SL13-000-S	6-10-98	ND (0.041)	6.8	0.61 J (1.2)	ND (0.041)	NA
600461	TA2-2-OVD1-SL01-000-S	7-07-98	ND (0.041)	5	0.39 J (1.2)	ND (0.041)	0.63
600461	TA2-2-OVD1-SL02-000-S	7-07-98	ND (0.038)	7.5	0.45 J (1.1)	ND (0.038)	0.79
600465	TA2-2-OVD3-SL01-000-S	7-13-98	ND (0.041)	8.7	0.43 J (1.2)	ND (0.041)	0.75
600474	TA2-2-OVD4-SL03-000-S	8-17-98	ND (0.042)	8.8	0.52 J (1.3)	ND (0.042)	0.69
600489	TA2-2-OVD7-SL02-000-S	9-14-98	ND (0.039)	8.1	0.78 J (1.2)	ND (0.039)	0.74
600489	TA2-2-OVD8-SL02-000-S	9-14-98	ND (0.038)	7.2	0.54 J (1.1)	ND (0.038)	0.71
600493	TA2-2-SLPE-SL39-000-S	9-21-98	ND (0.041)	8.5	0.71 J (1.2)	ND (0.041)	0.89
600493	TA2-2-SLPE-SL41-000-S	9-21-98	ND (0.039)	7.8	0.67 J (1.2)	ND (0.039)	1.3
600505	TA2-2-SLPE-SL44-000-S	11-03-98	0.055 J (0.15)	8.2	0.88 J (1.2)	ND (0.038)	1.2
601726	TA2-2-OVB1-SL01-000-S	4-14-99	ND (0.042 J)	8	0.65 J (1.3)	ND (0.042)	1.3
602093	TA2-2-OVA2-SL01-000-S	7-07-99	**0.21**	12	0.99 J (1.2)	ND (0.04)	0.93
602093	TA2-2-OVA3-SL01-000-S	7-07-99	**0.13 J (0.16)**	8.3	0.72 J (1.2)	ND (0.039)	0.76
602099	TA2-2-FILL-DIRT-1/2-S	7-28-99	**0.36 J**	11	0.93 J (1.2)	0.05 J (0.16)	0.73
602099	TA2-2-FILL-DIRT-2/2-S	7-28-99	**4.7 J**	12	0.93 J (1.2)	0.35	1.1
602591	TA2-2-OVA1-SL06-000-S	8-03-99	0.093 J (0.15)	11	ND (0.29 J)	ND (0.038)	1.3
602591	TA2-2-OVT2-P12-SL1-S	8-03-99	0.06 J (0.17)	9.8	ND (0.31 J)	0.052 J (0.17)	0.7
602591	TA2-2-OVT3-P10-SL1-S	8-03-99	0.048 J (0.17)	11	ND (0.32 J)	0.055 J (0.17)	1.2
602617	TA2-2-OVT1-P6-SL1-S	9-07-99	ND (0.039)	6.6	0.83 J (1.2)	0.044 J (0.16)	0.75

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
602784	TA2-2-OVT1-P4-SL1-S	10-04-99	**0.1 J (0.16)**	8.7	0.53 J (1.2)	ND (0.04)	0.58
602791	TA2-2-OVT1-P2-SL1-S	10-18-99	0.043 J (0.16)	9.2	0.99 J (1.2)	ND (0.041)	1.6
602791	TA2-2-OVT1-P3-SL1-S	10-18-99	0.066 J (0.16)	9.7	0.74 J (1.2)	0.039 J (0.16)	1.2
602800	TA2-2-OVT1-P1-SL1-S	10-27-99	ND (0.038)	6.5	ND (0.29 J)	ND (0.038)	1.1
602921	TA2-2-OVT2-P10-SL1-S	11-19-99	**0.1 J (0.15)**	10	ND (0.28 J)	ND (0.038)	0.51
602922	TA2-2-OVT2-P9-SL1-S	11-15-99	ND (0.04)	7.0	ND (0.3 J)	ND (0.04)	0.79
602940	TA2-2-OVT2-P8-SL1-S	12-01-99	0.092 J (0.15)	8.7	ND (0.29 J)	ND (0.038)	1.1
602967	TA2-2-OVT2-P6-SL1-S	1-03-00	**0.1 J (0.16)**	9.7 J	0.9 J (1.2)	ND (0.041)	0.89
602967	TA2-2-OVT2-P7-SL1-S	1-03-00	ND (0.04)	6.7 J	0.95 J (1.2)	ND (0.04)	0.77
602968	TA2-2-OVT2-P5/1-SL1-S	1-03-00	**0.14 J (0.17)**	10	0.64 J (1.2)	ND (0.042)	1.0
603057	TA2-2-OVT3-P2/3-SL1-S	2-28-00	**0.15 J (0.16)**	8.6	0.6 J (1.2)	ND (0.039)	0.84
603057	TA2-2-OVT3-P2/3-SL1-DU	2-28-00	**0.22**	12	0.77 J (1.2)	0.063 J (0.16)	1.3
603057	TA2-2-OVT3-P456-SL1-S	2-28-00	**0.12 J (0.16)**	8.8	0.61 J (1.2)	ND (0.041)	1.1
603068	TA2-2-OVT3-P789-SL1-S	3-02-00	**0.21**	11	0.5 J (1.2)	0.057 J (0.16)	1.1
603068	TA2-2-OVT3-P789-SL2-S	3-02-00	**0.13 J (0.16)**	9.3	0.43 J (1.2)	0.044 J (0.16)	1.2
603068	TA2-2-OVT3-P789-SL2-DU	3-02-00	**2.2**	12	0.46 J (1.1)	0.6	1.2
602606	TA2-2-EAST-FNCE-001-S	8-23-99	**1.2 J**	11	**1 J (1.1)**	0.4	1
602606	TA2-2-EAST-FNCE-001-DU	8-23-99	**1.1 J**	11	**1.3**	0.29	0.87
602607	TA2-2-TR2-EAST-FNCE-002-S	8-23-99	**1.29**	9 J	ND (0.252)	0.178 J (0.467)	0.802
602607	TA2-2-TR2-EAST-FNCE-002-DU	8-23-99	**1.15**	12.5 J	ND (0.248)	**1.3 J**	0.918
Soil Removed Directly from Artifacts (Bin Soils)							
601594	TA2-2-TRC7-C6-BIN-S	3-10-99	**11**	**400**	0.75 J (1.2)	**110**	0.7
601594	TA2-2-TRC8-C/F-BIN-S	3-10-99	**7.7 J**	**360**	0.84 J (1.3)	**63**	0.76
601594	TA2-2-TRC9-C/F-BIN-S	3-10-99	**5.4**	**120**	**1.1**	**8.2**	1.1
601594	TA2-2-TRD8-C/F-BIN-S	3-10-99	**4.7**	**290**	**1.1 J (1.2)**	**48**	0.9
602974	TA2-2-P225-2C/F-BIN-S	1-24-00	**14 J**	**150**	**1.1**	**6.9**	1
602974	TA2-2-P225-3C/F-BIN-S	1-24-00	**180 J**	**64**	0.87 J (1.2)	**1.8**	1
602796	TA2-2-COBL-GRIZ-002-S	10-20-99	**0.86**	12	0.56 J (1.3)	0.31	1.2

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
602796	TA2-2-COBL-GRIZ-003-S	10-20-99	**1.4**	13	0.51 J (1.2)	**2.8**	0.62
602796	TA2-2-COBL-GRIZ-004-S	10-20-99	**1.5**	12	0.59 J (1.2)	**1.3**	0.91
602796	TA2-2-COBL-GRIZ-004-D	10-20-99	**1.5**	9.4	0.54 J (1.2)	**4.3**	0.88
602796	TA2-2-COBL-GRIZ-005-S	10-20-99	**1**	14	0.75 J (1.2)	0.65	1.1
602600	TA2-2-COBL-GRIZ-TRA-S	8-18-99	**23**	17	ND (0.31 J)	0.28	0.95
602600	TA2-2-COBL-GRIZ-TRA-DUP	8-18-99	**7.1**	15	ND (0.3 J)	**1.2**	1.1
603073	TA2-2-1LAY-DOWN-BIN-S	3-09-00	**0.8**	13	0.96 J (1.2)	0.31	1.4
603073	TA2-2-2LAY-DOWN-BIN-S	3-09-00	**5.8**	14	0.6 J (1.2)	**1.9**	1.3
603073	TA2-2-3LAY-DOWN-BIN-S	3-09-00	**3.4**	15	**3.7**	0.72	1.2
603073	TA2-2-4LAY-DOWN-BIN-S	3-09-00	**1.6**	11	0.5 J (1.2)	0.97	1
603073	TA2-2-4LAY-DOWN-BIN-DU	3-09-00	**1.5**	13	0.33 J (1.2)	0.75	0.97
603073	TA2-2-5LAY-DOWN-BIN-S	3-09-00	**11**	14	0.59 J (1.2)	0.75	1.2
603073	TA2-2-6LAY-DOWN-BIN-S	3-09-00	**8.7**	12	0.36 J (1.2)	0.56	1.5
603073	TA2-2-7LAY-DOWN-BIN-S	3-09-00	**9.2**	18	**1.3**	**1**	1.3
603073	TA2-2-7LAY-DOWN-BIN-DU	3-09-00	**1.8**	16	0.5 J (1.2)	0.79	1.4
603073	TA2-2-8LAY-DOWN-BIN-S	3-09-00	**1.9**	20	0.45 J (1.3)	0.91	1.3
603073	TA2-2-9LAY-DOWN-BIN-S	3-09-00	**8.9**	18	0.44 J (1.2)	**1.4**	1.7
603077	TA2-2-2LAY-DOWN-BIN-S (off-site laboratory)	3-14-00	**1.53**	**194 J**	0.295 J (0.5)	**1.29 J**	1.08
603077	TA2-2-6LAY-DOWN-BIN-S (off-site laboratory)	3-14-00	**2.54**	10 J	ND (0.146)	**1.07 J**	1.24
603186	TA2-2-1LAY-DOWN-BIN-E	6-14-00	**1.9 J**	12	0.94 J (1.2)	0.51	1.1
603186	TA2-2-1LAY-DOWN-BIN-N	6-14-00	**3.2 J**	12	0.98 J (1.2)	0.43	1.9
603186	TA2-2-1LAY-DOWN-BIN-S	6-14-00	**2.8 J**	12	**1 J (1.2)**	0.59	1.9
603186	TA2-2-1LAY-DOWN-BIN-W	6-14-00	**3 J**	12	**2.2**	0.68	1.5
603186	TA2-2-1LAY-DOWN-BIN-WDU		**2.8 J**	10	**1.6**	0.5	0.89
603186	TA2-2-2LAY-DOWN-BIN-E	6-14-00	**3.2 J**	18	0.95 J (1.2)	0.76	1.3
603186	TA2-2-2LAY-DOWN-BIN-N	6-14-00	**1.5 J**	13	0.82 J (1.2)	0.52	1.2

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603186	TA2-2-2LAY-DOWN-BIN-NDU	6-14-00	**2.6 J**	21	**1.4**	**6.6**	1.6
603186	TA2-2-2LAY-DOWN-BIN-S	6-14-00	**3.9 J**	16	**1.2**	0.98	1.1
603186	TA2-2-2LAY-DOWN-BIN-W	6-14-00	**3.5 J**	24	**1 J (1.2)**	**2**	1.5
603186	TA2-2-3LAY-DOWN-BIN-E	6-14-00	**2.4 J**	15	0.89 J (1.2)	**1.2**	**4.4**
603186	TA2-2-3LAY-DOWN-BIN-EDU	6-14-00	**1.7 J**	10	0.71 J (1.2)	0.8	0.91
603186	TA2-2-3LAY-DOWN-BIN-N	6-14-00	**3.5 J**	17	**1.2**	**1.1**	1.9
603186	TA2-2-3LAY-DOWN-BIN-S	6-14-00	**2.6 J**	15	**1 J (1.2)**	0.67	1.2
603186	TA2-2-3LAY-DOWN-BIN-W	6-14-00	**2.6 J**	16	**1.2**	**1**	2.4
603186	TA2-2-4LAY-DOWN-BIN-E	6-14-00	**2.7 J**	10	0.89 J (1.2)	0.68	1
603186	TA2-2-4LAY-DOWN-BIN-N	6-14-00	**9.4**	9.5	0.79 J (1.2)	0.56	1.1
603186	TA2-2-4LAY-DOWN-BIN-S	6-14-00	**2.4 J**	10	0.67 J (1.2)	0.68	0.71
603186	TA2-2-4LAY-DOWN-BIN-SDU	6-14-00	**3 J**	16	0.89 J (1.2)	**3.5**	1.3
603186	TA2-2-4LAY-DOWN-BIN-W	6-14-00	**3 J**	8.3	0.71 J (1.2)	0.72	1.3
603186	TA2-2-5LAY-DOWN-BIN-E	6-14-00	**3.7 J**	11	**1.8**	0.53	1
603186	TA2-2-5LAY-DOWN-BIN-N	6-14-00	**2.1 J**	11	0.84 J (1.2)	0.73	1.3
603186	TA2-2-5LAY-DOWN-BIN-NDU	6-14-00	**2.4 J**	15	0.68 J (1.2)	0.83	1.2
603186	TA2-2-5LAY-DOWN-BIN-S	6-14-00	**2 J**	14	0.96 J (1.2)	0.44	1.3
603186	TA2-2-5LAY-DOWN-BIN-W	6-14-00	**2.3 J**	12	0.63 J (1.2)	0.57	1.1
603186	TA2-2-6LAY-DOWN-BIN-E	6-14-00	**2.4**	11	ND (0.3 J)	0.7	1.4
603186	TA2-2-6LAY-DOWN-BIN-EDU	6-14-00	**1.8**	11	ND (0.3 J)	0.38	1.1
603186	TA2-2-6LAY-DOWN-BIN-N	6-14-00	**1.5 J**	11	0.96 J (1.2)	0.29	1.2
603186	TA2-2-6LAY-DOWN-BIN-S	6-14-00	**3**	14	ND (1.4 U)	0.85	2.2
603186	TA2-2-6LAY-DOWN-BIN-W	6-14-00	**2.7**	12	ND (0.3 J)	0.91	1.2
603186	TA2-2-7LAY-DOWN-BIN-E	6-14-00	**3.3**	20	ND (0.3 J)	**1.1**	1.5
603186	TA2-2-7LAY-DOWN-BIN-N	6-14-00	**1.6**	18	ND (0.3 J)	0.76	1.1
603186	TA2-2-7LAY-DOWN-BIN-S	6-14-00	**2.4**	15	ND (0.33 J)	**1.7**	1.2
603186	TA2-2-7LAY-DOWN-BIN-SDU	6-14-00	**2.7**	18	**3**	0.7	1.2
603186	TA2-2-7LAY-DOWN-BIN-W	6-14-00	**2.2**	17	**9.6**	**1.8**	1.9

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603186	TA2-2-8LAY-DOWN-BIN-E	6-14-00	**2.3**	18	ND (0.3 J)	0.68	1.2
603186	TA2-2-8LAY-DOWN-BIN-N	6-14-00	**2.6**	11	ND (0.3 J)	0.7	1.2
603186	TA2-2-8LAY-DOWN-BIN-S	6-14-00	**2.1**	16	ND (0.3 J)	0.9	1.6
603186	TA2-2-8LAY-DOWN-BIN-W	6-14-00	**2.6**	14	ND (0.3 J)	0.62	**2.6**
603186	TA2-2-8LAY-DOWN-BIN-WDU	6-14-00	**5.8 J**	15	ND (1.2 U)	**1.1**	1.3
603186	TA2-2-9LAY-DOWN-BIN-E	6-14-00	**3.4 J**	15	ND (1.6 U)	0.77	**2.7**
603186	TA2-2-9LAY-DOWN-BIN-N	6-14-00	**3.5 J**	17	ND (0.3 J)	**1**	1.2
603186	TA2-2-9LAY-DOWN-BIN-NDU	6-14-00	**2.9 J**	13	ND (0.3 J)	**1.4**	1.2
603186	TA2-2-9LAY-DOWN-BIN-S	6-14-00	**9.2 J**	20	ND (1.3 U)	0.84	1.2
603186	TA2-2-9LAY-DOWN-BIN-W	6-14-00	**3 J**	16	ND (0.3 J)	0.68	1.6
603192	TA2-2-PIT-BURM-MIX-E-S	6-21-00	**0.3 J**	9.9	ND (0.3 J)	ND (0.18 U)	1.3
603193	TA2-2-PIT-BURM-MIX-E-S (off-site laboratory split)	6-21-00	**0.235 J**	7.1	ND (0.146)	ND (0.101)	1.18
603192	TA2-2-PIT-BURM-MIX-N-S	6-21-00	**0.47 J**	8.6	ND (0.3 J)	ND (0.04 J)	1.1
603193	TA2-2-PIT-BURM-MIX-N-S (off-site laboratory split)	6-21-00	**1.32 J**	8.91	ND (0.146)	ND (0.101)	0.932
603193	TA2-2-PIT-BURM-MIX-N-DU (off-site laboratory split)	6-21-00	**0.739 J**	6.73	ND (0.146)	ND (0.101)	0.942
603192	TA2-2-PIT-BURM-MIX-S-S	6-21-00	**0.15 J (0.16)**	5.8	ND (0.3 J)	ND (0.04)	0.61
603193	TA2-2-PIT-BURM-MIX-S-S (off-site laboratory split)	6-21-00	**0.267 J**	6.41	ND (0.146)	ND (0.101)	1.18
603192	TA2-2-PIT-BURM-MIX-W-S	6-21-00	**0.31 J**	9.2	ND (0.3 J)	ND (0.04 J)	1.1
603192	TA2-2-PIT-BURM-MIX-W-DU	6-21-00	**0.22 J**	6	ND (0.3 J)	ND (0.04 J)	1.3
603193	TA2-2-PIT-BURM-MIX-W-S (off-site laboratory split)	6-21-00	**0.321 J**	8.69	ND (0.146)	ND (0.101)	1.21
603197	TA2-2-CWLF-COBL-GRZ-1	6-26-00	**3.2**	22 J	ND (0.03 J)	**2.6**	1.1
603196	TA2-2-CWLF-COBL-GRZ-1 (off-site laboratory split)	6-26-00	**3.2**	21	0.313 J (0.499)	**3.31**	0.914

Refer to footnotes at end of table.

Table 5.6.3-6 (Continued)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603197	TA2-2-CWLF-COBL-GRZ-2	6-26-00	**2.2**	23 J	ND (0.03 J)	**4**	1.2
603196	TA2-2-CWLF-COBL-GRZ-2 (off-site laboratory split)	6-26-00	**1.98**	20.6	0.757	**4.33**	1.11
603197	TA2-2-CWLF-COBL-GRZ-3	6-26-00	**2.9**	15 J	ND (0.3 J)	**7.9**	1
603196	TA2-2-CWLF-COBL-GRZ-3 (off-site laboratory split)	6-26-00	**1.88**	17.6	ND (0.146)	**24**	0.979
603197	TA2-2-CWLF-COBL-GRZ-4	6-26-00	**4.1**	17 J	ND (0.3 J)	**6.3**	1.4
603197	TA2-2-CWLF-COBL-GRZ-4DU	6-26-00	**2.8**	14 J	ND (0.3 J)	**1.4**	1.2
603196	TA2-2-CWLF-COBL-GRZ-4 (off-site laboratory split)	6-26-00	**1.46**	13.7	0.338 J (0.498)	**2.93**	1.15
603196	TA2-2-CWLF-COBL-GRZ-4DU (off-site laboratory split)	6-26-00	**1.28**	13.5	0.631	**3.24**	0.946
603197	TA2-2-CWLF-COBL-GRZ-5	6-26-00	**2.5**	16	ND (0.3 J)	**1.8**	1.2
603196	TA2-2-CWLF-COBL-GRZ-5 (off-site laboratory split)	6-26-00	**2.42**	14.6	0.374 J (0.497)	**1.43**	1.02
603197	TA2-2-CWLF-COBL-GRZ-6	6-26-00	**2.1**	16 J	ND (0.3 J)	**1.6**	1.2
603196	TA2-2-CWLF-COBL-GRZ-6 (off-site laboratory split)	6-26-00	**2.75**	12.6	0.296 J (0.498)	**1.63**	0.906
603197	TA2-2-CWLF-COBL-GRZ-7	6-26-00	**4.1**	19 J	ND (0.3 J)	**1.9**	1.2
603196	TA2-2-CWLF-COBL-GRZ-7 (off-site laboratory split)	6-26-00	**4.18**	18.6	0.466 J (0.498)	**4.05**	1.02
603197	TA2-2-CWLF-COBL-GRZ-8	6-26-00	**2.8**	16 J	ND (0.3 J)	**2.5**	1.2
603197	TA2-2-CWLF-COBL-GRZ-8DU	6-26-00	**3.4**	20 J	ND (0.3 J)	**2.6**	1.2
603196	TA2-2-CWLF-COBL-GRZ-8 (off-site laboratory split)	6-26-00	**3.29**	**86.7**	0.465 J (0.5)	**4.05**	0.976
603196	TA2-2-CWLF-COBL-GRZ-8DU (off-site laboratory split)	6-26-00	**3.18**	25	0.538	**2.45**	0.946
603197	TA2-2-CWLF-COBL-GRZ-9	6-26-00	**2.3**	20 J	ND (0.3 J)	**2.3**	1.3

Refer to footnotes at end of table.

Table 5.6.3-6 (Concluded)
Summary of SWMU 2 Excavated Soil Sampling RCRA Metals plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–June 2000
(On-site Laboratory, except where noted)

Sample Attributes			Metals (EPA Method 6010A/ 6010B/ 6020/ 7471/ 7471A/6020/SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603196	TA2-2-CWLF-COBL-GRZ-9 (off-site laboratory split)	6-26-00	**2.46**	16.8	0.641	**2.86**	0.954
603197	TA2-2-CYLI-NDER-BRM-S	6-26-00	**0.94**	12 J	ND (0.3 J)	0.36	0.99
603196	TA2-2-CYLI-NDER-BRM-S (off-site laboratory split)	6-26-00	**0.986**	10.7	0.399 J (0.5)	0.415 J (0.5)	0.922
Borrow Area Soils Used to Backfill ACF- and W-Pits							
600003	TA2-2-BORROW-1	3-05-98	ND (0.041)	9.1 J	0.54 J (1.2)	ND (0.041)	NA
600003	TA2-2-BORROW-2	3-05-98	ND (0.041)	7.5 J	0.55 J (1.2)	0.08 J (0.16)	NA
Background Soil Concentrations—North Area[d]			<0.1	25.4	<1	<1	2.3
Quality Assurance/Quality Control Samples (mg/L)							
600059	TA2-2-PTW1-EB (off-site laboratory)	4-06-98	0.000104	0.00227	NA	NA	NA
600283	TA2-2-TRE5-0001-EB (off-site laboratory)	6-01-98	ND (0.0001)	ND (0.00227)	0.00226	0.00274 J	NA
600459	TA2-2-TRD1-0006-EB (off-site laboratory)	7-06-98	ND (0.0001)	ND (0.00227)	ND (0.0014)	ND (0.00062)	0.00004 J
600472	TA2-2-TRD6-0015-EB (off-site laboratory)	8-11-98	ND (0.0001)	ND (0.00227)	ND (0.0014)	ND (0.00062)	NA
600494	TA2-2-TRD8-0025-EB (off-site laboratory)	9-21-98	ND (0.00004)	ND (0.00129)	ND (0.00271)	ND (0.00073)	0.00013 J
601139	TA2-2-TRC7-0003-000-EB (off-site laboratory)	11-30-98	0.00021 J	ND (0.00129)	ND (0.00271)	0.00982 J	ND (0.00003)

Note: Values in **bold** exceed background soil concentrations.
[a] EPA November 1986.
[b] Analysis request/chain-of-custody record.
[c] Sample naming scheme is provided in Table 5.6.2-1.
[d] From Dinwiddie September 1997. Subsurface values are used for comparison, because these samples were collected 15 to 18 feet below the surface.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ID = Identification.
J = Estimated value. See Data Validation report.
J ( ) = The reported value is greater than or equal to the method detection limit but is less than the practical quantification limit, shown in parentheses.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligrams(s) per liter.
NA = Not analyzed.
ND ( ) = Not detected above the method detection limit, shown in parentheses.
ND (U) = Not detected at laboratory reported value, shown in parentheses.
RCRA = Resource Conservation and Recovery Act.
SWMU = Solid Waste Management Unit.

Table 5.6.3-7
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference					
Record Number[a]	ER Sample ID[b]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
Excavated Soil Samples								
600290	TA2-2-TRE6-SL22-000-S TA2-2-TRE6-SL22-000-DUP	6-08-98	26.7	NC	7.6	7.6	2.1	7.3
600470	TA2-2-TRD4-SL03-000-S TA2-2-TRD4-SL03-000-DUP	8-10-98	6.1	NC	31.8	50.0	1.3	9.2
600470	TA2-2-TRD5-SL05-000-S TA2-2-TRD5-SL05-000-DUP	8-10-98	21.4	NC	0.0	22.7	14.6	20.0
600489	TA2-2-TRD7-SL03-000-S TA2-2-TRD7-SL03-000-DUP	9-14-98	8.7	NC	6.1	NC	17.1	26.8
600502	TA2-2-TRD8-SL01-049-S TA2-2-TRD8-SL01-049-DUP	10-20-98	6.7	NC	5.3	1.04	NC	40.0
602606	TA2-2-TR2-P12-SL6-S TA2-2-TR2-P12-SL6-DU	8-23-99	14.8	NC	0.0	10.7	7.4	16.4
602607	TA2-2-TR2-P12A-SL6-S TA2-2-TR2-P12A-SL6-DU (off-site laboratory)	8-23-99	3.3	8.1	NC	NC	23.7	NC
602796	TA2-2-TRB3-SL16-003-S TA2-2-TRB3-SL16-003-D	10-20-99	15.4	NC	16.9	41.6	69.4	6.0
602796	TA2-2-TRC9-SL83-004-S TA2-2-TRC9-SL83-004-D	10-20-99	5.9	NC	0.0	38.9	0.0	0.0
602796	TA2-2-TR2-P9-SL1-S TA2-2-TR2-P9-SL1-D	1-03-00	9.5	NC	21.0	NC	NC	59.3
602968	TA2-2-TR2-P8-SL1-S TA2-2-TR2-P8-SL1-DU	1-03-00	8.0	NC	0.0	NC	10.0	36.3
602974	TA2-2-TR2-P543-SL1-S TA2-2-TR2-P543-SL1-DU	1-24-00	18.8	NC	2.6	53.7	64.2	NC
603057	TA2-2-TR2-P2/1-SL1-S TA2-2-TR2-P2/1-SL1-DU	2-28-00	2.9	NC	27.9	6.8	35.3	20.7

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference					
Record Number[a]	ER Sample ID[b]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603068	TA2-2-TR3-P456-SL5-S TA2-2-TR3-P456-SL5-DU	3-02-00	10.5	NC	2.4	72.7	8.0	40.4
603070	TA2-2-TR3-P456-SL1-S TA2-2-TR3-P456-SL1-DU (off-site laboratory)	3-07-00	2.6	29.2	NC	78.0	9.1	NC
603070	TA2-2-TR3-P456-SL4-S TA2-2-TR3-P456-SL4-DU (off-site laboratory)	3-07-00	18.6	3.6	NC	116.9	1.6	NC
603070	TA2-2-TR3-P789-SL2-S TA2-2-TR3-P789-SL2-DU (off-site laboratory)	3-07-00	7.6	23.4	NC	159.0	8.1	NC
603070	TA2-2-TR3-P789-SL3-S TA2-2-TR3-P789-SL3-DU (off-site laboratory)	3-07-00	13.7	5.0	NC	181.2	100.4	NC
600285	TA2-2-OVTE-SL11-000-S TA2-2-OVTE-SL11-000-DUP	6-01-98	37.5	NC	19.7	NC	35.7	22.7
603057	TA2-2-OVT3-P2/3-SL1-S TA2-2-OVT3-P2/3-SL1-DU	2-28-00	21.6	NC	11.8	64.9	16.8	11.2
603068	TA2-2-OVT3-P789-SL2-S TA2-2-OVT3-P789-SL2-DU	3-02-00	9.0	NC	11.5	179.7	56.4	71.2
602606	TA2-2-EAST-FNCE-001-S TA2-2-EAST-FNCE-001-DU	8-23-00	6.4	NC	9.4	15.4	8.0	13.1
602607	TA2-2-TR2-EAST-FNCE-002-S TA2-2-TR2-EAST-FNCE-002-DU	8-23-00	12.0	6.8	NC	NC	20.1	NC
602796	TA2-2-COBL-GRIZ-004-S TA2-2-COBL-GRIZ-004-D	10-20-99	NC	NC	5.3	23.0	4.3	84.0
602600	TA2-2-COBL-GRIZ-TRA-S TA2-2-COBL-GRIZ-TRA-DUP	8-18-99	NC	NC	34.8	32.6	NC	5.0

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference					
Record Number[a]	ER Sample ID[b]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603073	TA2-2-4LAY-DOWN-BIN-S TA2-2-4LAY-DOWN-BIN-DU	3-09-00	3.2	NC	4.4	1.1	54.6	62.1
603073	TA2-2-7LAY-DOWN-BIN-S TA2-2-7LAY-DOWN-BIN-DU	3-09-00	3.0	NC	3.3	9.5	6.4	34.8
603186	TA2-2-1LAY-DOWN-BIN-W TA2-2-1LAY-DOWN-BIN-WDU	6-14-00	NC	NC	9.5	NC	NC	28.6
603186	TA2-2-2LAY-DOWN-BIN-N TA2-2-2LAY-DOWN-BIN-NDU	6-14-00	5.9	NC	25.6	NC	NC	14.6
603186	TA2-2-3LAY-DOWN-BIN-E TA2-2-3LAY-DOWN-BIN-EDU	6-14-00	NC	NC	29.6	NC	NC	74.2
603186	TA2-2-4LAY-DOWN-BIN-S TA2-2-4LAY-DOWN-BIN-SDU	6-14-00	NC	NC	2.3	NC	190.7	58.8
603186	TA2-2-5LAY-DOWN-BIN-N TA2-2-5LAY-DOWN-BIN-NDU	6-14-00	NC	NC	0.0	NC	0.0	23.5
603186	TA2-2-6LAY-DOWN-BIN-E TA2-2-6LAY-DOWN-BIN-EDU	6-14-00	NC	NC	3.4	NC	NC	27.0
603196	TA2-2-7LAY-DOWN-BIN-S TA2-2-7LAY-DOWN-BIN-SDU	6-14-00	18.8	NC	3.6	NC	NC	23.3
603186	TA2-2-8LAY-DOWN-BIN-W TA2-2-8LAY-DOWN-BIN-WDU	6-14-00	14.9	NC	23.3	NC	NC	NC
603186	TA-2-9LAY-DOWN-BIN-N TA-2-9LAY-DOWN-BIN-NDU	6-14-00	NC	NC	25.6	55.6	NC	NC
603192	TA2-2-PIT-BURM-MIX-W-S TA2-2-PIT-BURM-MIX-W-DU	6-21-00	NC	NC	26.5	40.4	NC	NC
603193	TA2-2-PIT-BURM-MIX-N-S TA2-2-PIT-BURM-MIX-N-DU (off-site laboratory)	6-21-00	7.9	15.1	NC	NC	8.0	15.7

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference					
Record Number[a]	ER Sample ID[b]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603196	TA2-2-CWLF-COBL-GRZ-4 TA2-2-CWLF-COBL-GRZ-4DU (off-site laboratory)	6-26-00	13.9	1.0	NC	NC	12.2	12.0
603196	TA2-2-CWLF-COBL-GRZ-8 TA2-2-CWLF-COBL-GRZ-8DU (off-site laboratory)	6-26-00	5.6	18.7	NC	NC	5.1	15.6
603197	TA2-2-CWLF-COBL-GRZ-4 TA2-2-CWLF-COBL-GRZ-4DU	6-26-00	9.8	NC	18.9	143.4	7.4	30.8
603197	TA2-2-CWLF-COBL-GRZ-8 TA2-2-CWLF-COBL-GRZ-8DU	6-26-00	17.5	NC	3.4	34.2	18.2	18.2
Excavation Confirmatory Samples from the Excavation Floor and Sidewalls								
603352	TA2-2-FINAL-FLR-400N-3900E-0.5 TA2-2-FINAL-FLR-400N-3900E-D (off-site laboratory)	8-07-00	10.2	NC	NC	NC	NC	9.0
603352	TA2-2-FINAL-FLR-450N-4000E-0.5 TA2-2-FINAL-FLR-450N-4000E-D (off-site laboratory)	8-07-00	10.1	NC	NC	NC	NC	13.6
603356	TA2-2-FINAL-FLR-500N-3850E-0.5 TA2-2-FINAL-FLR-500N-3850E-D (off-site laboratory)	8-08-00	5.4	0.2	NC	NC	22.2	13.5
603356	TA2-2-FINAL-FLR-500N-4100E-0.5 TA2-2-FINAL-FLR-500N-4100E-D (off-site laboratory)	8-08-00	4.2	37.3	NC	NC	15.8	9.5
603356	TA2-2-FINAL-SDW-550N-3950E-1.0 TA2-2-FINAL-SDW-550N-3950E-D (off-site laboratory)	8-08-00	12.7	2.9	NC	NC	11.0	1.0

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference					
Record Number[a]	ER Sample ID[b]	Sample Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603358	TA2-2-FINAL-SDW-375N-4000E-1.0 TA2-2-FINAL-SDW-375N-4000E-D (off-site laboratory)	8-08-00	16.2	8.2	NC	NC	7.9	1.2
603358	TA2-2-FINAL-SDW-450N-4150E-1.0 TA2-2-FINAL-SDW-450N-4150E-D (off-site laboratory)	8-08-00	15.9	17.4	NC	NC	13.3	13.7
603360	TA2-2-FINAL-SDW-450N-3770E-1.0 TA2-2-FINAL-SDW-450N-3770E-D (off-site laboratory)	8-09-00	15.0	9.8	NC	NC	12.7	6.3

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference				
Record Number[a]	ER Sample ID[b]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
Excavated Soil Samples							
600290	TA2-2-TRE6-SL22-000-S TA2-2-TRE6-SL22-000-DUP	6-08-98	NC	2.7	NC	NC	NC
600470	TA2-2-TRD4-SL03-000-S TA2-2-TRD4-SL03-000-DUP	8-10-98	NC	0.0	NC	NC	11.2
600470	TA2-2-TRD5-SL05-000-S TA2-2-TRD5-SL05-000-DUP	8-10-98	NC	31.4	NC	NC	34.0
600489	TA2-2-TRD7-SL03-000-S TA2-2-TRD7-SL03-000-DUP	9-14-98	NC	10.2	NC	NC	14.5
600502	TA2-2-TRD8-SL01-049-S TA2-2-TRD8-SL01-049-DUP	10-20-98	23.5	8.0	NC	NC	62.3
602606	TA2-2-TR2-P12-SL6-S TA2-2-TR2-P12-SL6-DU	8-23-99	NC	6.9	8.7	145.7	32.3
602607	TA2-2-TR2-P12A-SL6-S TA2-2-TR2-P12A-SL6-DU (off-site laboratory)	8-23-99	16.4	NC	NC	NC	26.6
602796	TA2-2-TRB3-SL16-003-S TA2-2-TRB3-SL16-003-D	10-20-99	9.8	15.8	NC	NC	59.7
602796	TA2-2-TRC9-SL83-004-S TA2-2-TRC9-SL83-004-D	10-20-99	8.0	15.4	NC	0.0	5.4
602796	TA2-2-TR2-P9-SL1-S TA2-2-TR2-P9-SL1-D	1-03-00	17.4	NC	NC	NC	48.9
602968	TA2-2-TR2-P8-SL1-S TA2-2-TR2-P8-SL1-DU	1-03-00	NC	34.5	NC	29.5	0.0
602974	TA2-2-TR2-P543-SL1-S TA2-2-TR2-P543-SL1-DU	1-24-00	NC	100.0	NC	7.3	8.7
603057	TA2-2-TR2-P2/1-SL1-S TA2-2-TR2-P2/1-SL1-DU	2-28-00	4.3	46.2	NC	0.0	56.4

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference				
Record Number[a]	ER Sample ID[b]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603068	TA2-2-TR3-P456-SL5-S TA2-2-TR3-P456-SL5-DU	3-02-00	59.3	2.1	NC	8.7	8.0
603070	TA2-2-TR3-P456-SL1-S TA2-2-TR3-P456-SL1-DU (off-site laboratory)	3-07-00	NC	9.6	NC	NC	0.9
603070	TA2-2-TR3-P456-SL4-S TA2-2-TR3-P456-SL4-DU (off-site laboratory)	3-07-00	NC	10.6	NC	NC	61.1
603070	TA2-2-TR3-P789-SL2-S TA2-2-TR3-P789-SL2-DU (off-site laboratory)	3-07-00	NC	12.6	NC	NC	23.5
603070	TA2-2-TR3-P789-SL3-S TA2-2-TR3-P789-SL3-DU (off-site laboratory)	3-07-00	NC	45.6	NC	NC	13.7
600285	TA2-2-OVTE-SL11-000-S TA2-2-OVTE-SL11-000-DUP	6-01-98	NC	8.2	NC	NC	NC
603057	TA2-2-OVT3-P2/3-SL1-S TA2-2-OVT3-P2/3-SL1-DU	2-28-00	NC	33.0	NC	NC	43.0
603068	TA2-2-OVT3-P789-SL2-S TA2-2-OVT3-P789-SL2-DU	3-02-00	NC	25.4	NC	NC	0.0
602606	TA2-2-EAST-FNCE-001-S TA2-2-EAST-FNCE-001-DU	8-23-00	NC	0.0	NC	31.9	13.9
602607	TA2-2-TR2-EAST-FNCE-002-S TA2-2-TR2-EAST-FNCE-002-DU	8-23-00	11.5	NC	NC	NC	13.5
602796	TA2-2-COBL-GRIZ-004-S TA2-2-COBL-GRIZ-004-D	10-20-99	0.0	24.3	NC	107.1	3.4
602600	TA2-2-COBL-GRIZ-TRA-S TA2-2-COBL-GRIZ-TRA-DUP	8-18-99	105.6	12.5	NC	124.3	14.6

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference				
Record Number[a]	ER Sample ID[b]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603073	TA2-2-4LAY-DOWN-BIN-S TA2-2-4LAY-DOWN-BIN-DU	3-09-00	6.4	16.7	NC	25.6	3.1
603073	TA2-2-7LAY-DOWN-BIN-S TA2-2-7LAY-DOWN-BIN-DU	3-09-00	134.6	11.8	NC	23.5	7.4
603186	TA2-2-1LAY-DOWN-BIN-W TA2-2-1LAY-DOWN-BIN-WDU	6-14-00	NC	18.2	31.6	30.5	51.0
603186	TA2-2-2LAY-DOWN-BIN-N TA2-2-2LAY-DOWN-BIN-NDU	6-14-00	NC	47.1	NC	170.8	28.6
603186	TA2-2-3LAY-DOWN-BIN-E TA2-2-3LAY-DOWN-BIN-EDU	6-14-00	NC	40.0	NC	40.0	131.4
603186	TA2-2-4LAY-DOWN-BIN-S TA2-2-4LAY-DOWN-BIN-SDU	6-14-00	NC	46.2	NC	134.9	58.7
603186	TA2-2-5LAY-DOWN-BIN-N TA2-2-5LAY-DOWN-BIN-NDU	6-14-00	NC	30.8	NC	12.8	8.0
603186	TA2-2-6LAY-DOWN-BIN-E TA2-2-6LAY-DOWN-BIN-EDU	6-14-00	28.6	0.0	NC	59.3	24.0
603196	TA2-2-7LAY-DOWN-BIN-S TA2-2-7LAY-DOWN-BIN-SDU	6-14-00	11.8	18.2	NC	83.3	0.0
603186	TA2-2-8LAY-DOWN-BIN-W TA2-2-8LAY-DOWN-BIN-WDU	6-14-00	NC	6.9	NC	55.8	66.7
603186	TA-2-9LAY-DOWN-BIN-N TA-2-9LAY-DOWN-BIN-NDU	6-14-00	NC	26.7	NC	33.3	0.0
603192	TA2-2-PIT-BURM-MIX-W-S TA2-2-PIT-BURM-MIX-W-DU	6-21-00	NC	42.1	NC	NC	16.7
603193	TA2-2-PIT-BURM-MIX-N-S TA2-2-PIT-BURM-MIX-N-DU (off-site laboratory)	6-21-00	NC	27.9	NC	NC	1.1

Refer to footnotes at end of table.

Table 5.6.3-7 (Continued)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference				
Record Number[a]	ER Sample ID[b]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603196	TA2-2-CWLF-COBL-GRZ-4 TA2-2-CWLF-COBL-GRZ-4DU (off-site laboratory)	6-26-00	13.1	1.5	NC	10.0	19.5
603196	TA2-2-CWLF-COBL-GRZ-8 TA2-2-CWLF-COBL-GRZ-8DU (off-site laboratory)	6-26-00	3.4	110.5	NC	49.2	3.1
603197	TA2-2-CWLF-COBL-GRZ-4 TA2-2-CWLF-COBL-GRZ-4DU	6-26-00	37.7	NC	NC	127.3	15.4
603197	TA2-2-CWLF-COBL-GRZ-8 TA2-2-CWLF-COBL-GRZ-8DU	6-26-00	19.4	NC	NC	3.9	0.0
Excavation Confirmatory Samples from the Excavation Floor and Sidewalls							
603352	TA2-2-FINAL-FLR-400N-3900E-0.5 TA2-2-FINAL-FLR-400N-3900E-D (off-site laboratory)	8-07-00	6.5	NC	NC	NC	29.8
603352	TA2-2-FINAL-FLR-450N-4000E-0.5 TA2-2-FINAL-FLR-450N-4000E-D (off-site laboratory)	8-07-00	2.7	NC	NC	NC	41.4
603356	TA2-2-FINAL-FLR-500N-3850E-0.5 TA2-2-FINAL-FLR-500N-3850E-D (off-site laboratory)	8-08-00	14.7	20.0	NC	NC	24.0
603356	TA2-2-FINAL-FLR-500N-4100E-0.5 TA2-2-FINAL-FLR-500N-4100E-D (off-site laboratory)	8-08-00	28.9	9.4	NC	NC	7.6
603356	TA2-2-FINAL-SDW-550N-3950E-1.0 TA2-2-FINAL-SDW-550N-3950E-D (off-site laboratory)	8-08-00	19.8	8.2	NC	NC	26.7

Refer to footnotes at end of table.

Table 5.6.3-7 (Concluded)
Summary of SWMU 2 Field Duplicate Relative Percent Differences for
Excavated Soil and Excavation Confirmatory Soil Sampling RCRA Metals Plus Beryllium, Nickel, and Uranium Analyses
March 1998–August 2000
(On-site Laboratory, except where noted)

Sample Attributes			Relative Percent Difference				
Record Number[a]	ER Sample ID[b]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603358	TA2-2-FINAL-SDW-375N-4000E-1.0 TA2-2-FINAL-SDW-375N-4000E-D (off-site laboratory)	8-08-00	140.2	16.1	NC	NC	5.2
603358	TA2-2-FINAL-SDW-450N-4150E-1.0 TA2-2-FINAL-SDW-450N-4150E-D (off-site laboratory)	8-08-00	18.4	8.2	NC	NC	17.1
603360	TA2-2-FINAL-SDW-450N-3770E-1.0 TA2-2-FINAL-SDW-450N-3770E-D (off-site laboratory)	8-09-00	50.5	16.3	NC	NC	25.3

[a]Analysis request/chain-of-custody record.
[b]Sample naming scheme is provided in Table 5.6.2-1.
ER = Environmental Restoration.
ID = Identification.
NC = Not calculated for estimated or nondetected results.
RCRA = Resource Conservation and Recovery Act.
SWMU = Solid Waste Management Unit.

Table 5.6.3-8
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
Record		Sample	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Number[a]	ER Sample ID[b]	Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
Soil Excavated from Pits and Trenches										
600045	TA2-2-ACF1-0001-SL2-S	4-01-98	0.0503	0.0282	0.878	0.477	ND (0.197)	--	0.991	0.69
600065	TA2-2-ACF2-0001-SL4-S	4-13-98	0.0489	0.0422	0.852	0.446	ND (0.196)	--	ND (1.3)	--
600040	TA2-2-ACF3-0001-SL1-S	3-23-98	0.0289	0.0196	0.834	0.429	ND (0.27)	--	ND (1.92)	--
600040	TA2-2-ACF4-0001-SL1-S	3-24-98	0.058	0.0403	0.794	0.404	ND (0.236)	--	ND (1.72)	--
600044	TA2-2-ACF4-0001-SL5-S	3-26-98	0.0526	0.0169	0.676	0.325	ND (0.159)	--	ND (1.38)	--
600460	TA2-2-ACF5-SL06-000-S	7-07-98	ND (0.0299)	--	0.673	0.362	ND (0.173)	--	1.25	0.886
600060	TA2-2-PW12-0001-SL7-S	4-07-98	0.0363	0.0314	0.764	0.427	ND (0.221)	--	ND (3.06)	--
600060	TA2-2-PW12-0001-SL8-S	4-07-98	ND (0.0347)	--	0.694	0.344	ND (0.183)	--	0.507	0.485
600063	TA2-2-PTW2-0001-12-S	4-09-98	ND (0.0272)	--	0.581	0.334	ND (0.179)	--	ND (1.53)	--
600068	TA2-2-PTW3-0001-SL4-S	4-14-98	0.00842	0.00857	0.76	0.379	ND (0.22)	--	ND (2.96)	--
600073	TA2-2-PTW4-0001-15-S	4-20-98	ND (0.0319)	--	0.696	0.426	ND (0.186)	--	0.821	0.626
600075	TA2-2-PTW4-SL10-000-S	4-23-98	0.0205	0.0205	0.772	0.369	ND (0.229)	--	ND (3.15)	--
600075	TA2-2-PTW4-SL14-000-S	4-23-98	0.0215	0.0196	0.755	0.358	ND (0.225)	--	ND (3.01)	--
600075	TA2-2-PTW4-SL15-000-S	4-23-98	ND (0.0312)	--	0.686	0.449	ND (0.222)	--	ND (3.06)	--
600079	TA2-2-TRE1-0001-000-S	4-28-98	ND (0.0677)	--	0.851	0.45	**3.28**	0.945	**208**	45.9
600084	TA2-2-TRE1-SL06-000-S	5-06-98	0.0325	0.0199	0.637	0.318	ND (0.172)	--	**2.72**	1.13
600084	TA2-2-TRE1-SL13-000-S	5-06-98	0.00978	0.0109	0.646	0.316	ND (0.122)	--	**2.52**	0.971
600086	TA2-2-TRE2-SL07-000-S	5-11-98	0.00967	0.00427	0.619	0.296	ND (0.214)	--	**3.16**	3.66
600278	TA2-2-TRE3-SL07-000-S	5-21-98	ND (0.0248)	--	0.671	0.353	**0.0844**	0.0787	**1.74**	1.7
600275	TA2-2-TRE4-0001-000-S	5-12-98	ND (0.0406)	--	0.707	0.357	ND (0.285)	--	ND (3.95)	--
600278	TA2-2-TRE4-SL10-000-S	5-21-98	ND (0.0308)	--	0.656	0.319	ND (0.172)	--	0.738	0.588
600284	TA2-2-TRE5-SL08-000-S	6-01-98	ND (0.0308)	--	0.672	0.338	ND (0.216)	--	ND (3.06)	--
600284	TA2-2-TRE5-SL17-000-S	6-01-98	ND (0.028)	--	0.625	0.314	ND (0.206)	--	ND (2.86)	--
600289	TA2-2-TRE6-SL09-000-S	6-08-98	ND (0.0286)	--	0.727	0.381	ND (0.181)	--	ND (1.58)	--
600289	TA2-2-TRE6-SL22-000-S	6-08-98	ND (0.026)	--	0.707	0.351	ND (0.179)	--	ND (1.54)	--
600289	TA2-2-TRE6-SL22-000-DUP	6-08-98	ND (0.0268)	--	0.742	0.355	ND (0.176)	--	ND (1.55)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
600295	TA2-2-TRE7-SL08-000-S	6-17-98	ND (0.0314)	--	0.718	0.389	ND (0.226)	--	ND (3.3)	--
600295	TA2-2-TRE7-SL13-000-S	6-17-98	ND (0.0302)	--	0.677	0.369	ND (0.218)	--	ND (3.09)	--
600295	TA2-2-TRE7-SL25-000-S	6-17-98	ND (0.0309)	--	0.675	0.339	ND (0.216)	--	ND (3)	--
600298	TA2-2-TRE7-SL37-000-S	6-23-98	ND (0.0284)	--	0.651	0.32	ND (0.181)	--	ND (1.59)	--
600298	TA2-2-TRE7-SL49-000-S	6-23-98	0.0103	0.00948	0.668	0.327	ND (0.158)	--	ND (1.42)	--
600298	TA2-2-TRE7-SL55-000-S	6-23-98	ND (0.0259)	--	0.651	0.313	ND (0.167)	--	ND (1.46)	--
600300	TA2-2-TRE8-SL01-000-S	6-25-98	ND (0.0316)	--	0.696	0.357	ND (0.172)	--	ND (1.14)	--
600300	TA2-2-TRE8-SL14-000-S	6-25-98	ND (0.0282)	--	0.737	0.353	ND (0.203)	--	ND (2.82)	--
600302	TA2-2-TRE8-SL07-000-S	6-29-98	ND (0.0322)	--	0.616	0.326	ND (0.178)	--	0.966	0.649
600302	TA2-2-TRE8-SL21-000-S	6-29-98	ND (0.0256)	--	0.595	0.292	ND (0.173)	--	ND (1.53)	--
600302	TA2-2-TRE8-SL29-000-S	6-29-98	ND (0.0341)	--	0.717	0.356	ND (0.177)	--	0.511	0.515
600462	TA2-2-TRD1-SL02-000-S	7-07-98	ND (0.0296)	--	0.679	0.342	ND (0.185)	--	ND (1.7)	--
600462	TA2-2-TRD1-SL06-000-S	7-07-98	ND (0.0389)	--	0.899	0.454	ND (0.235)	--	1.07	1.05
600462	TA2-2-TRD1-SL09-000-S	7-07-98	ND (0.0332)	--	0.792	0.39	ND (0.2)	--	ND (1.84)	--
600462	TA2-2-TRD1-SL12-000-S	7-07-98	0.0118	0.0137	0.755	0.379	ND (0.189)	--	ND (1.74)	--
600464	TA2-2-TRD2-SL01-000-S	7-13-98	ND (0.0311)	--	0.717	0.377	ND (0.227)	--	ND (3.19)	--
600464	TA2-2-TRD2-SL05-000-S	7-13-98	ND (0.0314)	--	0.741	0.431	ND (0.232)	--	ND (3.22)	--
600466	TA2-2-TRD3-SL03-000-S	7-20-98	ND (0.0358)	--	0.682	0.389	ND (0.177)	--	**1.34**	0.693
600466	TA2-2-TRD3-SL06-000-S	7-20-98	ND (0.0339)	--	0.591	0.318	ND (0.187)	--	**1.33**	0.748
600466	TA2-2-TRD3-SL12-000-S	7-20-98	ND (0.0315)	--	0.63	0.333	ND (0.17)	--	0.923	0.653
600469	TA2-2-TRD4-SL03-000-S	8-10-98	ND (0.0328)	--	0.785	0.378	ND (0.236)	--	ND (0.786)	--
600469	TA2-2-TRD4-SL03-000-DUP	8-10-98	ND (0.0314)	--	0.613	0.317	ND (0.221)	--	0.982	0.639
600469	TA2-2-TRD4-SL05-000-S	8-10-98	ND (0.0281)	--	0.69	0.335	ND (0.215)	--	ND (0.709)	--
600469	TA2-2-TRD4-SL05-000-DUP	8-10-98	ND (0.0308)	--	0.761	1.31	ND (0.23)	--	0.535	0.377
600469	TA2-2-TRD4-SL07-000-S	8-10-98	ND (0.0286)	--	0.589	0.302	ND (0.202)	--	0.753	0.547
600469	TA2-2-TRD4-SL14-000-S	8-10-98	ND (0.0317)	--	0.691	0.333	ND (0.221)	--	0.658	0.426

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
600473	TA2-2-TRD6-SL03-000-S	8-17-98	ND (0.0281)	--	0.645	0.314	ND (0.203)	--	ND (0.535)	--
600473	TA2-2-TRD6-SL08-000-S	8-17-98	ND (0.0279)	--	0.646	0.339	ND (0.205)	--	0.834	0.422
600473	TA2-2-TRD6-SL15-000-S	8-17-98	ND (0.0273)	--	0.648	0.581	ND (0.196)	--	ND (0.676)	--
600473	TA2-2-TRD6-SL19-000-S	8-17-98	ND (0.0277)	--	0.628	0.301	ND (0.202)	--	0.437	0.402
600473	TA2-2-TRD6-SL23-000-S	8-17-98	ND (0.0271)	--	0.677	0.323	0.1	0.172	0.663	0.502
600488	TA2-2-TRD7-SL03-000-S	9-14-98	ND (0.0308)	--	0.612	0.301	ND (0.217)	--	0.605	0.367
600488	TA2-2-TRD7-SL11-000-S	9-14-98	ND (0.0318)	--	0.601	0.343	0.136	0.189	0.921	0.425
600488	TA2-2-TRD7-SL13-000-S	9-14-98	0.0224	0.0213	0.735	0.349	ND (0.196)	--	0.749	0.468
600488	TA2-2-TRD7-SL23-000-S	9-14-98	ND (0.0294)	--	0.704	0.335	0.123	0.178	0.387	0.436
600501	TA2-2-TRD8-SL01-049-S	10-20-98	0.0127	0.0105	0.725	0.365	ND (0.194)	--	0.779	0.455
600501	TA2-2-TRD8-SL04-000-S	10-20-98	0.0194	0.0223	0.705	0.335	ND (0.207)	--	ND (0.712)	--
600501	TA2-2-TRD8-SL16-000-S	10-20-98	ND (0.0327)	--	0.778	0.372	ND (0.226)	--	0.732	0.616
600501	TA2-2-TRD8-SL27-000-S	10-20-98	ND (0.0322)	--	0.649	0.348	ND (0.218)	--	ND (0.537)	--
600501	TA2-2-TRD8-SL33-000-S	10-20-98	ND (0.0316)	--	0.689	0.34	0.106	0.188	0.543	0.409
600501	TA2-2-TRD8-SL45-000-S	10-20-98	ND (0.0302)	--	0.684	0.332	ND (0.218)	--	0.552	0.353
600504	TA2-2-TRC9-SL01-000-S	11-03-98	ND (0.0345)	--	0.825	0.452	0.107	0.205	1.08	0.54
600504	TA2-2-TRC9-SL05-000-S	11-03-98	ND (0.0369)	--	0.784	0.381	**0.206**	0.22	ND (0.878)	--
600504	TA2-2-TRC9-SL19-000-S	11-03-98	ND (0.0377)	--	0.813	0.469	ND (0.208)	--	ND (0.572)	--
601133	TA2-2-TRC9-SL24-000-S	11-17-98	ND (0.0327)	--	0.788	0.42	0.108	0.194	0.833	0.614
601133	TA2-2-TRC9-SL42-000-S	11-17-98	ND (0.039)	--	0.835	0.42	0.12	0.227	0.315	0.362
601133	TA2-2-TRC9-SL57-000-S	11-17-98	ND (0.0325)	--	0.783	0.393	0.114	0.2	0.875	0.501
601133	TA2-2-TRC9-SL71-000-S	11-17-98	ND (0.0371)	--	0.86	0.417	**0.365**	0.231	0.952	0.501
602795	TA2-2-TRC9-SL83-001-S	10-20-99	ND (0.0353)	--	0.716	1.06	ND (0.19)	--	ND (0.527)	--
601140	TA2-2-TRC9-SL83-000-S	1-13-99	ND (0.0327)	--	0.853	0.46	ND (0.234)	--	ND (0.799)	--
601140	TA2-2-TRC8-SL04-000-S	1-13-99	0.0142	0.0257	0.841	0.436	0.162	0.165	ND (0.727)	--
601140	TA2-2-TRC8-SL11-000-S	1-13-99	ND (0.0294)	--	0.711	0.406	0.172	0.175	ND (0.737)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
601140	TA2-2-TRC8-SL17-000-S	1-13-99	**0.114**	0.0415	0.755	0.406	ND (0.219)	--	ND (0.734)	--
601140	TA2-2-TRC7-SL01-000-S	1-13-99	0.024	0.0127	0.822	0.43	0.171	0.172	ND (0.774)	--
601140	TA2-2-TRC7-SL21-000-S	1-13-99	0.0205	0.019	0.778	0.476	ND (0.224)	--	ND (0.746)	--
601141	TA2-2-TRC6-SL01-000-S	1-13-99	ND (0.048)	--	1.04	0.998	**0.222**	0.199	0.731	0.543
601141	TA2-2-TRC6-SL02-000-S	1-13-99	0.0436	0.044	0.896	0.525	ND (0.265)	--	1.15	0.887
601141	TA2-2-TRC6-SL03-000-S	1-13-99	ND (0.0278)	--	0.913	0.513	0.128	0.208	ND (0.51)	--
601141	TA2-2-TRC6-SL04-000-S	1-13-99	0.021	0.0216	0.998	0.515	ND (0.245)	--	1.01	1.02
601142	TA2-2-TRC6-SL05-000-S	1-14-99	0.0366	0.049	1.03	0.601	**0.201**	0.277	ND (0.907)	--
601142	TA2-2-TRC6-SL06-000-S	1-14-99	ND (0.0522)	--	0.945	0.569	**0.195**	0.235	ND (0.748)	--
601142	TA2-2-TRC6-SL07-000-S	1-14-99	ND (0.0553)	--	1.11	0.665	ND (0.29)	--	ND (0.81)	--
601146	TA2-2-TRC7-C6-BIN-S	1-25-99	**0.136**	0.0604	0.815	0.489	**0.248**	0.199	0.476	0.437
601146	TA2-2-TRC8-C/F-BIN-S	1-25-99	0.0508	0.04	0.746	0.459	ND (0.224)	--	ND (0.619)	--
601146	TA2-2-TRC9-C/F-BIN-S	1-25-99	0.0308	0.0328	0.708	0.379	0.138	0.172	**1.61**	1.29
601146	TA2-2-TRD8-C/F-BIN-S	1-25-99	0.0626	0.0338	0.591	0.366	ND (0.194)	--	ND (0.533)	--
601152	TA2-2-TRC5-SL01-000-S	1-28-99	ND (0.0434)	--	0.963	0.54	ND (0.235)	--	ND (0.663)	--
601152	TA2-2-TRC5-SL02-000-S	1-28-99	0.0331	0.0414	0.94	0.537	ND (0.24)	--	ND (0.674)	--
601152	TA2-2-TRC5-SL03-000-S	1-28-99	ND (0.0297)	--	1.03	0.579	ND (0.278)	--	ND (0.776)	--
601152	TA2-2-TRC5-SL07-000-S	1-28-99	ND (0.0246)	--	1.04	0.618	ND (0.264)	--	ND (0.753)	--
601153	TA2-2-TRC5-SL05-000-S	2-01-99	ND (0.0381)	--	0.962	0.507	0.153	0.208	ND (0.901)	--
601153	TA2-2-TRC5-SL06-000-S	2-01-99	ND (0.0366)	--	0.954	0.524	ND (0.248)	--	ND (0.851)	--
601153	TA2-2-TRC5-SL07-000-S	2-01-99	0.0314	0.0262	0.927	0.486	ND (0.213)	--	ND (0.746)	--
601155	TA2-2-TRC5-SL08-000-S	2-02-99	ND (0.0555)	--	0.989	0.577	ND (0.278)	--	ND (0.773)	--
601155	TA2-2-TRC5-SL09-000-S	2-02-99	ND (0.0449)	--	0.737	0.423	ND (0.234)	--	0.445	0.417
601155	TA2-2-TRC5-SL10-000-S	2-02-99	ND (0.0549)	--	0.93	0.508	ND (0.274)	--	ND (0.685)	--
601156	TA2-2-TRC5-SL11-000-S	2-03-99	0.0358	0.0303	0.861	0.485	ND (0.225)	--	ND (0.632)	--
601156	TA2-2-TRC5-SL12-000-S	2-03-99	0.0173	0.0223	0.911	0.497	ND (0.235)	--	ND (0.669)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
Record Number[a]	ER Sample ID[b]	Sample Date	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
			Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
601156	TA2-2-TRC5-SL13-000-S	2-03-99	ND (0.0412)	--	0.843	0.482	ND (0.221)	--	ND (0.607)	--
601593	TA2-2-TRC4-SL01-000-S	3-09-99	ND (0.0269)	--	0.687	0.371	ND (0.175)	--	ND (0.567)	--
601593	TA2-2-TRC4-SL02-000-S	3-09-99	ND (0.0361)	--	0.753	0.431	ND (0.196)	--	ND (0.555)	--
601593	TA2-2-TRC4-SL03-000-S	3-09-99	ND (0.0317)	--	0.797	0.427	**0.189**	0.166	0.92	0.5
601593	TA2-2-TRC4-SL04-000-S	3-09-99	ND (0.0341)	--	ND (0.15)	--	ND (0.197)	--	ND (0.574)	--
601593	TA2-2-TRC4-SL05-000-S	3-09-99	ND (0.0285)	--	0.735	0.418	0.137	0.153	0.573	0.691
601593	TA2-2-TRC4-SL06-000-S	3-09-99	ND (0.0288)	--	0.861	0.439	ND (0.193)	--	0.77	0.799
601593	TA2-2-TRC4-SL07-000-S	3-09-99	ND (0.032)	--	0.797	0.428	**0.193**	0.172	ND (0.638)	--
601593	TA2-2-TRC4-SL08-000-S	3-09-99	ND (0.0272)	--	0.642	0.417	ND (0.17)	--	ND (0.558)	--
601597	TA2-2-TRC3-SL01-000-S	3-10-99	ND (0.0362)	--	0.792	0.454	ND (0.203)	--	ND (0.539)	--
601597	TA2-2-TRC3-SL02-000-S	3-10-99	0.0319	0.0329	0.807	0.47	ND (0.221)	--	0.874	0.426
601597	TA2-2-TRC3-SL03-000-S	3-11-99	ND (0.0385)	--	0.807	0.449	ND (0.211)	--	ND (0.565)	--
601597	TA2-2-TRC3-SL04-000-S	3-11-99	0.051	0.028	0.788	0.454	ND (0.21)	--	ND (0.562)	--
601597	TA2-2-TRC3-SL05-000-S	3-11-99	ND (0.0391)	--	0.905	0.501	0.138	0.182	ND (0.588)	--
601597	TA2-2-TRC3-SL06-000-S	3-11-99	ND (0.0344)	--	0.802	0.421	ND (0.2)	--	ND (0.526)	--
601598	TA2-2-TRC3-SL07-000-S	3-15-99	ND (0.0303)	--	0.817	0.453	ND (0.226)	--	ND (0.775)	--
601598	TA2-2-TRC3-SL08-000-S	3-15-99	ND (0.0304)	--	0.831	0.407	ND (0.224)	--	ND (0.763)	--
601598	TA2-2-TRC3-SL09-000-S	3-15-99	ND (0.033)	--	0.712	0.419	ND (0.221)	--	ND (0.781)	--
601599	TA2-2-TRC3-SL10-000-S	3-22-99	ND (0.0428)	--	0.825	0.477	ND (0.237)	--	ND (0.671)	--
601599	TA2-2-TRC3-SL11-000-S	3-22-99	ND (0.0437)	--	0.772	0.449	ND (0.226)	--	0.916	1.15
601599	TA2-2-TRC3-SL12-000-S	3-22-99	ND (0.0429)	--	0.755	0.455	ND (0.229)	--	ND (0.632)	--
601599	TA2-2-TRC3-SL13-000-S	3-22-99	ND (0.0365)	--	0.779	0.397	ND (0.196)	--	ND (0.492)	--
601599	TA2-2-TRC3-SL14-000-S	3-22-99	ND (0.035)	--	0.85	0.446	ND (0.203)	--	ND (0.564)	--
601599	TA2-2-TRC3-SL15-000-S	3-22-99	ND (0.0364)	--	0.81	0.481	ND (0.216)	--	ND (0.591)	--
601599	TA2-2-TRC3-SL16-000-S	3-22-99	ND (0.0353)	--	0.813	1.2	ND (0.203)	--	ND (0.548)	--
601602	TA2-2-TRC2-SL01-000-S	4-07-99	ND (0.0379)	--	0.763	0.507	ND (0.226)	--	ND (0.621)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
601602	TA2-2-TRC2-SL02-000-S	4-07-99	ND (0.0211)	--	0.877	0.498	ND (0.22)	--	ND (0.595)	--
601602	TA2-2-TRC2-SL03-000-S	4-07-99	ND (0.041)	--	0.794	0.358	ND (0.222)	--	ND (0.607)	--
601602	TA2-2-TRC2-SL04-000-S	4-07-99	ND (0.039)	--	0.825	0.479	0.169	0.185	ND (0.582)	--
601602	TA2-2-TRC2-SL05-000-S	4-07-99	ND (0.0323)	--	0.79	0.851	ND (0.226)	--	ND (0.777)	--
601602	TA2-2-TRC2-SL06-000-S	4-07-99	ND (0.0305)	--	0.656	0.36	0.106	0.173	ND (0.735)	--
601602	TA2-2-TRC2-SL07-000-S	4-07-99	ND (0.0321)	--	0.716	0.416	ND (0.219)	--	ND (0.771)	--
601602	TA2-2-TRC2-SL08-000-S	4-07-99	ND (0.0301)	--	0.704	0.428	ND (0.218)	--	ND (0.772)	--
601604	TA2-2-TRC1-SL01-000-S	4-08-99	ND (0.032)	--	0.755	0.448	ND (0.214)	--	ND (0.732)	--
601604	TA2-2-TRC1-SL02-000-S	4-08-99	ND (0.0327)	--	0.791	0.467	0.163	0.192	ND (0.829)	--
601604	TA2-2-TRC1-SL03-000-S	4-08-99	ND (0.0357)	--	0.771	0.448	ND (0.26)	--	ND (0.864)	--
601604	TA2-2-TRC1-SL04-000-S	4-08-99	ND (0.0336)	--	0.743	0.426	0.122	0.179	ND (0.794)	--
601604	TA2-2-TRC1-SL05-000-S	4-08-99	ND (0.0371)	--	0.922	0.501	ND (0.258)	--	ND (0.851)	--
601604	TA2-2-TRC1-SL06-000-S	4-08-99	ND (0.031)	--	0.761	0.428	ND (0.237)	--	ND (0.81)	--
601604	TA2-2-TRC1-SL07-000-S	4-08-99	ND (0.0333)	--	0.75	0.424	ND (0.23)	--	ND (0.767)	--
601604	TA2-2-TRC1-SL08-000-S	4-08-99	ND (0.0336)	--	0.811	0.43	ND (0.228)	--	ND (0.782)	--
601606	TA2-2-TRB1-SL01-000-S	4-13-99	ND (0.0182)	--	ND (0.134)	--	0.178	0.17	ND (0.711)	--
601606	TA2-2-TRB1-SL02-000-S	4-13-99	ND (0.0313)	--	0.693	0.401	ND (0.218)	--	ND (0.752)	--
601606	TA2-2-TRB1-SL03-000-S	4-13-99	ND (0.0322)	--	0.718	0.407	ND (0.224)	--	ND (0.767)	--
601606	TA2-2-TRB1-SL04-000-S	4-13-99	ND (0.0292)	--	0.828	0.416	ND (0.214)	--	ND (0.732)	--
601606	TA2-2-TRB1-SL05-000-S	4-13-99	ND (0.0309)	--	0.852	0.473	ND (0.21)	--	ND (0.725)	--
601608	TA2-2-TRB1-SL06-000-S	4-14-99	ND (0.0453)	--	0.738	0.466	**0.228**	0.212	ND (0.668)	--
601608	TA2-2-TRB1-SL07-000-S	4-14-99	ND (0.0467)	--	0.857	0.505	ND (0.128)	--	ND (0.668)	--
601608	TA2-2-TRB1-SL08-000-S	4-14-99	ND (0.0406)	--	0.797	0.812	0.122	0.203	ND (0.649)	--
601608	TA2-2-TRB1-SL09-000-S	4-14-99	ND (0.0376)	--	0.668	0.341	ND (0.0957)	--	ND (0.55)	--
601608	TA2-2-TRB1-SL10-000-S	4-14-99	ND (0.0343)	--	0.683	0.393	ND (0.192)	--	0.656	0.375
601727	TA2-2-TRB1-SL11-000-S	4-19-99	0.0307	0.00447	0.896	0.473	ND (0.222)	--	ND (0.755)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
601727	TA2-2-TRB1-SL12-000-S	4-19-99	ND (0.0158)	--	0.799	0.454	ND (0.223)	--	ND (0.765)	--
601727	TA2-2-TRB2-SL01-000-S	4-19-99	ND (0.0142)	--	0.746	0.387	ND (0.201)	--	ND (0.672)	--
601727	TA2-2-TRB2-SL02-000-S	4-19-99	ND (0.0288)	--	0.781	0.421	ND (0.215)	--	ND (0.732)	--
601730	TA2-2-TRB3-SL01-000-S	4-27-99	ND (0.0286)	--	0.811	0.42	ND (0.205)	--	ND (0.7)	--
601730	TA2-2-TRB3-SL02-000-S	4-27-99	ND (0.0277)	--	0.702	0.484	ND (0.21)	--	ND (0.694)	--
601730	TA2-2-TRB3-SL03-000-S	4-27-99	ND (0.0291)	--	0.728	0.416	0.087	0.163	0.614	0.545
601730	TA2-2-TRB3-SL04-000-S	4-27-99	ND (0.0279)	--	0.717	0.417	ND (0.208)	--	ND (0.708)	--
601732	TA2-2-TRB3-SL05-000-S	4-28-99	ND (0.0278)	--	0.767	0.404	ND (0.2)	--	ND (0.647)	--
601732	TA2-2-TRB3-SL06-000-S	4-28-99	ND (0.0281)	--	0.819	0.428	ND (0.204)	--	ND (0.716)	--
601732	TA2-2-TRB3-SL07-000-S	4-28-99	ND (0.0118)	--	0.642	0.347	ND (0.185)	--	ND (0.653)	--
601732	TA2-2-TRB3-SL08-000-S	4-28-99	ND (0.0159)	--	0.786	0.364	ND (0.208)	--	ND (0.705)	--
601733	TA2-2-TRB3-SL09-000-S	5-12-99	ND (0.0401)	--	ND (0.179)	--	ND (0.215)	--	0.76	0.577
601733	TA2-2-TRB3-SL10-000-S	5-12-99	ND (0.036)	--	0.848	0.447	ND (0.204)	--	ND (0.589)	--
601733	TA2-2-TRB3-SL11-000-S	5-12-99	ND (0.0359)	--	0.735	0.45	0.154	0.189	ND (0.568)	--
601733	TA2-2-TRB3-SL12-000-S	5-12-99	ND (0.0347)	--	0.951	0.424	ND (0.246)	--	ND (0.838)	--
601733	TA2-2-TRB3-SL13-000-S	5-12-99	ND (0.0313)	--	0.78	1.41	ND (0.226)	--	ND (0.787)	--
601733	TA2-2-TRB3-SL14-000-S	5-12-99	ND (0.0304)	--	0.873	0.458	ND (0.224)	--	ND (0.769)	--
601742	TA2-2-TRB3-SL15-000-S	6-02-99	ND (0.0305)	--	0.849	0.45	0.12	0.171	ND (0.721)	--
601742	TA2-2-TRB3-SL16-000-S	6-02-99	ND (0.0259)	--	0.744	0.382	0.169	0.16	**2.88**	1.5
602795	TA2-2-TRB3-SL16-001-S	10-20-99	ND (0.0371)	--	0.805	0.429	ND (0.192)	--	ND (0.522)	--
601742	TA2-2-TRB3-SL17-000-S	6-02-99	ND (0.0295)	--	ND (0.12)	--	ND (0.205)	--	ND (0.686)	--
601744	TA2-2-TRA3-SL01-000-S	6-09-99	ND (0.0318)	--	0.814	0.476	0.143	0.183	ND (0.766)	--
601744	TA2-2-TRA3-SL02-000-S	6-09-99	ND (0.0322)	--	0.76	0.409	ND (0.221)	--	ND (0.75)	--
601744	TA2-2-TRA3-SL03-000-S	6-09-99	ND (0.0336)	--	0.828	0.389	0.175	0.194	ND (0.848)	--
601744	TA2-2-TRA3-SL04-000-S	6-09-99	ND (0.0351)	--	ND (0.184)	--	0.113	0.195	ND (0.875)	--
601744	TA2-2-TRA3-SL05-000-S	6-09-99	ND (0.0367)	--	0.879	0.495	ND (0.241)	--	ND (0.85)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
602084	TA2-2-TRA3-SL06-000-S	6-17-99	0.0127	0.00747	0.747	0.413	ND (0.211)	--	ND (0.741)	--
602084	TA2-2-TRA3-SL07-000-S	6-17-99	ND (0.0321)	--	0.85	0.454	ND (0.226)	--	ND (0.792)	--
602084	TA2-2-TRA3-SL08-000-S	6-17-99	ND (0.0372)	--	0.785	1.55	ND (0.252)	--	ND (0.856)	--
602084	TA2-2-TRA3-SL09-000-S	6-17-99	0.0114	0.012	0.7	0.451	ND (0.238)	--	ND (0.796)	--
602084	TA2-2-TRA3-SL10-000-S	6-17-99	ND (0.0304)	--	0.743	0.337	ND (0.219)	--	ND (0.759)	--
602084	TA2-2-TRA3-SL11-000-S	6-17-99	ND (0.0375)	--	0.969	0.489	ND (0.252)	--	ND (0.837)	--
602084	TA2-2-TRA3-SL12-000-S	6-17-99	ND (0.0325)	--	0.822	0.432	ND (0.226)	--	ND (0.761)	--
602084	TA2-2-TRA3-SL13-000-S	6-17-99	ND (0.0321)	--	0.898	0.481	ND (0.237)	--	ND (0.804)	--
602085	TA2-2-TRA3-SL14-000-S	6-21-99	ND (0.0313)	--	ND (0.141)	--	0.1	0.178	ND (0.775)	--
602085	TA2-2-TRA3-SL15-000-S	6-21-99	ND (0.0324)	--	ND (0.146)	--	ND (0.228)	--	ND (0.803)	--
602085	TA2-2-TRA3-SL16-000-S	6-21-99	ND (0.028)	--	0.858	0.447	ND (0.214)	--	ND (0.726)	--
602089	TA2-2-TRA2-SL01-000-S	6-30-99	ND (0.033)	--	0.89	0.429	ND (0.219)	--	ND (0.762)	--
602089	TA2-2-TRA2-SL02-000-S	6-30-99	ND (0.0463)	--	**3.58**	2.33	ND (0.332)	--	ND (1.16)	--
602089	TA2-2-TRA2-SL03-000-S	6-30-99	ND (0.0363)	--	0.784	0.37	ND (0.242)	--	ND (0.842)	--
602089	TA2-2-TRA2-SL04-000-S	6-30-99	ND (0.036)	--	0.767	0.438	ND (0.247)	--	ND (0.864)	--
602089	TA2-2-TRA2-SL05-000-S	6-30-99	ND (0.0334)	--	0.851	0.48	0.113	0.184	ND (0.778)	--
602091	TA2-2-TRA2-SL06-000-S	7-07-99	ND (0.032)	--	0.727	0.428	ND (0.218)	--	ND (0.744)	--
602091	TA2-2-TRA2-SL07-000-S	7-07-99	ND (0.033)	--	0.812	0.486	0.161	0.189	ND (0.846)	--
602094	TA2-2-TRA2-SL02-2ND-S	7-12-99	ND (0.03)	--	0.785	0.415	ND (0.217)	--	ND (0.748)	--
602094	TA2-2-TRA2-SL02-RE-S	7-12-99	ND (0.0333)	--	0.902	0.48	**0.18**	0.186	ND (0.805)	--
602096	TA2-2-TRA1-SL01-000-S	7-20-99	ND (0.0332)	--	0.93	0.517	ND (0.24)	--	ND (0.831)	--
602096	TA2-2-TRA1-SL02-000-S	7-20-99	ND (0.0295)	--	0.844	0.457	ND (0.21)	--	ND (0.733)	--
602096	TA2-2-TRA1-SL03-000-S	7-20-99	0.0166	0.0169	0.785	0.415	ND (0.21)	--	ND (0.746)	--
602096	TA2-2-TRA1-SL04-000-S	7-20-99	ND (0.0276)	--	ND (0.117)	--	ND (0.211)	--	ND (0.699)	--
602100	TA2-2-TRA1-SL05-000-S	7-28-99	ND (0.0303)	--	0.942	0.5	ND (0.219)	--	ND (0.735)	--
602100	TA2-2-TRA1-SL06-000-S	7-28-99	ND (0.0261)	--	0.816	0.426	ND (0.196)	--	ND (0.68)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
Record Number[a]	ER Sample ID[b]	Sample Date	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
			Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
602599	TA2-2-P331-3C/F-BIN-S	8-18-99	0.029	0.0355	0.869	0.486	ND (0.208)	--	ND (0.571)	--
602599	TA2-2-P331-4C/F-BIN-S	8-18-99	ND (0.0417)	--	0.93	0.444	0.113	0.181	ND (0.575)	--
602920	TA2-2-TR2-P10-SL1-S	11-11-99	ND (0.0244)	--	ND (0.11)	--	0.102	0.143	ND (0.614)	--
602920	TA2-2-TR2-P10-SL2-S	11-11-99	ND (0.0269)	--	ND (0.107)	--	0.105	0.143	ND (0.628)	--
602931	TA2-2-TR2-P8-SL1-S	11-23-99	ND (0.0275)	--	0.824	0.437	ND (0.199)	--	ND (0.661)	--
602931	TA2-2-TR2-P8-SL2-S	11-23-99	ND (0.0275)	--	ND (0.125)	--	0.0793	0.148	ND (0.659)	--
602931	TA2-2-TR2-P8-SL3-S	11-23-99	ND (0.0275)	--	0.75	0.681	0.14	0.161	ND (0.697)	--
602599	TA2-2-TR2-P12-SL1-S	8-18-99	ND (0.038)	--	0.871	0.624	ND (0.2)	--	ND (0.549)	--
602599	TA2-2-TR2-P12-SL2-S	8-18-99	ND (0.0357)	--	0.731	0.405	0.112	0.178	0.998	1.15
602599	TA2-2-TR2-P12-SL3-S	8-18-99	ND (0.0388)	--	0.797	0.432	0.151	0.187	ND (0.523)	--
602599	TA2-2-TR2-P12-SL4-S	8-18-99	ND (0.0345)	--	ND (0.137)	--	0.102	0.172	0.915	0.508
602599	TA2-2-TR2-P12-SL5-S	8-18-99	ND (0.0369)	--	ND (0.164)	--	ND (0.209)	--	ND (0.595)	--
602605	TA2-2-TR2-P12-SL6-S	8-23-99	ND (0.0382)	--	1.1	1.61	ND (0.266)	--	ND (0.934)	--
602612	TA2-2-TR2-P12-SL7-S	8-31-99	ND (0.0345)	--	0.872	0.462	ND (0.231)	--	ND (0.818)	--
602612	TA2-2-TR2-P12-SL8-S	8-31-99	ND (0.0300)	--	0.704	0.407	ND (0.215)	--	1.16	1.29
601740	TA2-2-P298-0C/F-BIN-S	5-27-99	ND (0.0316)	--	0.803	0.386	ND (0.198)	--	1.2	0.612
601740	TA2-2-P298-1C/F-BIN-S	5-27-99	**0.247**	0.0457	0.78	0.444	ND (0.206)	--	ND (0.669)	--
601740	TA2-2-P298-2C/F-BIN-S	5-27-99	0.0425	0.0347	0.934	0.517	ND (0.226)	--	ND (0.723)	--
602092	TA2-2-P298-3C/F-BIN-S	7-07-99	ND (0.0193)	--	0.776	0.422	0.107	0.197	ND (0.848)	--
602612	TA2-2-P333-6C/F-BIN-S	8-31-99	0.0271	0.0211	0.828	0.429	0.101	0.165	ND (0.722)	--
602618	TA2-2-TR1-P6-SL1-S	9-02-99	ND (0.0284)	--	0.885	0.395	ND (0.216)	--	ND (0.738)	--
602618	TA2-2-TR1-P6-SL2-S	9-02-99	ND (0.0302)	--	ND (0.136)	--	ND (0.216)	--	ND (0.755)	--
602618	TA2-2-TR1-P6-SL3-S	9-02-99	ND (0.0275)	--	0.905	0.447	ND (0.199)	--	ND (0.695)	--
602618	TA2-2-TR1-P6-SL4-S	9-02-99	ND (0.0293)	--	0.92	0.487	0.145	0.173	ND (0.753)	--
602618	TA2-2-TR1-P6-SL5-S	9-02-99	ND (0.03)	--	0.713	0.372	ND (0.211)	--	ND (0.693)	--
602618	TA2-2-TR1-P6-SL6-S	9-02-99	ND (0.0273)	--	ND (0.125)	--	**0.237**	0.159	ND (0.675)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
602618	TA2-2-TR1-P6-SL7-S	9-02-99	ND (0.0282)	--	0.785	0.413	ND (0.202)	--	ND (0.683)	--
602618	TA2-2-TR1-P6-SL8-S	9-02-99	ND (0.0278)	--	0.759	0.389	0.0958	0.155	ND (0.683)	--
602618	TA2-2-TR1-P6-SL9-S	9-02-99	ND (0.03)	--	ND (0.132)	--	ND (0.22)	--	ND (0.748)	--
602618	TA2-2-TR1-P6-SL10-S	9-02-99	ND (0.0274)	--	0.78	0.403	ND (0.196)	--	ND (0.685)	--
602618	TA2-2-TR1-P6-SL11-S	9-02-99	ND (0.0314)	--	0.704	0.439	ND (0.207)	--	ND (0.745)	--
602782	TA2-2-TR1-P4-SL1-S	9-22-99	ND (0.0393)	--	0.583	0.174	ND (0.207)	--	ND (0.574)	--
602782	TA2-2-TR1-P4-SL2-S	9-22-99	ND (0.0343)	--	0.74	0.392	ND (0.178)	--	ND (0.439)	--
602782	TA2-2-TR1-P4-SL3-S	9-22-99	ND (0.0349)	--	ND (0.153)	--	0.15	0.163	ND (0.52)	--
602787	TA2-2-TR1-P3-SL1-S	10-13-99	ND (0.0274)	--	0.606	0.284	ND (0.186)	--	ND (0.682)	--
602787	TA2-2-TR1-P3-SL2-S	10-13-99	ND (0.0303)	--	0.844	0.391	ND (0.208)	--	ND (0.749)	--
602789	TA2-2-TR1-P2-SL1-S	10-18-99	0.0369	0.0598	0.593	0.349	ND (0.205)	--	ND (0.71)	--
602789	TA2-2-TR1-P2-SL2-S	10-18-99	ND (0.0315)	--	0.829	0.399	0.0981	0.165	ND (0.745)	--
602789	TA2-2-TR1-P2-SL3-S	10-18-99	0.0088	0.0142	0.812	0.451	ND (0.245)	--	ND (0.877)	--
602789	TA2-2-TR1-P2-SL4-S	10-18-99	ND (0.0313)	--	0.898	0.49	ND (0.211)	--	ND (0.757)	--
602789	TA2-2-TR1-P2-SL5-S	10-18-99	ND (0.0191)	--	0.779	0.423	0.178	0.174	ND (0.79)	--
602789	TA2-2-TR1-P2-SL6-S	10-18-99	ND (0.0309)	--	0.65	0.393	ND (0.213)	--	ND (0.727)	--
602794	TA2-2-TR1-P2-SL7-S	10-19-99	ND (0.0355)	--	0.725	0.37	ND (0.187)	--	ND (0.562)	--
602794	TA2-2-TR1-P2-SL8-S	10-19-99	ND (0.0358)	--	ND (0.156)	--	0.0766	0.147	ND (0.534)	--
602801	TA2-2-TR1-P1-SL1-S	10-28-99	ND (0.0277)	--	ND (0.116)	--	ND (0.196)	--	ND (0.681)	--
602801	TA2-2-TR1-P1-SL2-S	10-28-99	ND (0.0249)	--	ND (0.103)	--	ND (0.178)	--	ND (0.605)	--
602801	TA2-2-TR1-P1-SL3-S	10-28-99	ND (0.0257)	--	0.708	0.367	ND (0.184)	--	ND (0.628)	--
602801	TA2-2-TR1-P1-SL4-S	10-28-99	ND (0.026)	--	0.6	0.326	0.116	0.145	ND (0.617)	--
602801	TA2-2-TR1-P1-SL5-S	10-28-99	ND (0.0266)	--	0.571	0.292	ND (0.187)	--	ND (0.647)	--
602608	TA2-2-P191-5C/F-BIN-S	8-23-99	0.0457	0.022	0.785	0.974	ND (0.0819)	--	**1.69**	0.907
602783	TA2-2-P339-7C/F-BIN-S	9-30-99	0.0183	0.0223	0.692	0.391	0.088	0.17	0.648	0.627
602801	TA2-2-P350-3C/F-BIN-S	10-28-99	0.00863	0.0106	0.78	0.359	ND (0.214)	--	ND (0.731)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
602801	TA2-2-P350-4C/F-BIN-S	10-28-99	ND (0.027)	--	0.9	0.448	0.122	0.155	ND (0.703)	--
602810	TA2-2-P360-5C/F-BINS-S	11-15-99	ND (0.0425)	--	0.584	0.333	ND (0.318)	--	ND (0.935)	--
602965	TA2-2-TR2-P9-SL1-S	1-03-00	ND (0.0341)	--	0.757	0.394	ND (0.178)	--	ND (0.478)	--
602965	TA2-2-TR2-P9-SL2-S	1-03-00	ND (0.0329)	--	0.789	0.412	ND (0.114)	--	0.607	0.423
602965	TA2-2-TR2-P9-SL3-S	1-03-00	ND (0.0303)	--	0.756	0.444	ND (0.171)	--	0.707	0.86
602966	TA2-2-TR2-P7-SL1-S	1-03-00	ND (0.026)	--	0.749	0.392	ND (0.181)	--	ND (0.635)	--
602966	TA2-2-TR2-P7-SL2-S	1-03-00	ND (0.0278)	--	0.772	0.395	ND (0.197)	--	ND (0.69)	--
602966	TA2-2-TR2-P8-SL1-S	1-03-00	ND (0.028)	--	0.812	0.519	ND (0.2)	--	ND (0.662)	--
602966	TA2-2-TR2-P8-SL2-S	1-03-00	ND (0.0256)	--	0.855	0.434	ND (0.186)	--	ND (0.643)	--
602969	TA2-2-TR2-P6-SL1-S	1-10-00	ND (0.0261)	--	0.785	0.574	0.0814	0.149	ND (0.664)	--
602969	TA2-2-TR2-P6-SL2-S	1-10-00	ND (0.0246)	--	0.667	0.325	ND (0.176)	--	ND (0.608)	--
602969	TA2-2-TR2-P6-SL3-S	1-10-00	ND (0.0264)	--	0.706	0.383	ND (0.189)	--	ND (0.647)	--
602969	TA2-2-TR2-P6-SL4-S	1-10-00	ND (0.024)	--	0.637	0.335	ND (0.174)	--	ND (0.582)	--
602973	TA2-2-TR2-P543-SL1-S	1-24-00	ND (0.0264)	--	0.788	0.4	ND (0.192)	--	ND (0.655)	--
602973	TA2-2-TR2-P543-SL2-S	1-24-00	ND (0.0287)	--	0.891	0.454	ND (0.202)	--	ND (0.722)	--
602973	TA2-2-TR2-P543-SL3-S	1-24-00	ND (0.0268)	--	0.677	0.379	ND (0.192)	--	ND (0.654)	--
602973	TA2-2-TR2-P543-SL4-S	1-24-00	ND (0.0252)	--	0.597	0.351	0.125	0.0202	ND (0.67)	--
602973	TA2-2-TR2-P543-SL5-S	1-24-00	ND (0.0266)	--	0.627	0.327	ND (0.193)	--	ND (0.644)	--
602979	TA2-2-TR2-P2/1-SL1-S	2-09-00	ND (0.0309)	--	0.689	0.379	ND (0.173)	--	ND (0.467)	--
602979	TA2-2-TR2-P2/1-SL2-S	2-09-00	ND (0.0333)	--	0.874	0.486	ND (0.184)	--	ND (0.494)	--
602979	TA2-2-TR2-P2/1-SL3-S	2-09-00	ND (0.033)	--	0.739	0.422	ND (0.179)	--	ND (0.456)	--
602979	TA2-2-TR2-P2/1-SL4-S	2-09-00	ND (0.0329)	--	ND (0.141)	--	ND (0.182)	--	ND (0.51)	--
602979	TA2-2-TR3-P2/3-SL1-S	2-09-00	ND (0.0342)	--	0.749	0.417	ND (0.182)	--	ND (0.524)	--
602979	TA2-2-TR3-P2/3-SL2-S	2-09-00	ND (0.0347)	--	0.718	0.393	ND (0.185)	--	ND (0.508)	--
602979	TA2-2-TR3-P2/3-SL3-S	2-09-99	ND (0.0321)	--	0.789	0.432	ND (0.185)	--	ND (0.497)	--
602979	TA2-2-TR3-P2/3-SL4-S	2-09-00	ND (0.0332)	--	0.753	0.428	0.162	0.158	ND (0.491)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
603059	TA2-2-TR3-P456-SL1-S	2-28-00	ND (0.0294)	--	0.774	0.436	0.099	0.149	ND (0.484)	--
603059	TA2-2-TR3-P456-SL2-S	2-28-00	ND (0.034)	--	ND (0.14)	--	ND (0.186)	--	ND (0.521)	--
603059	TA2-2-TR3-P456-SL3-S	2-28-00	ND (0.036)	--	0.594	0.356	ND (0.183)	--	ND (0.517)	--
603059	TA2-2-TR3-P456-SL4-S	2-28-00	ND (0.0358)	--	0.616	0.319	0.13	0.236	ND (0.527)	--
603059	TA2-2-TR3-P456-SL5-S	2-28-00	ND (0.0323)	--	0.731	0.391	ND (0.187)	--	0.831	0.46
603059	TA2-2-TR3-P456-SL6-S	2-28-00	ND (0.0317)	--	0.647	1.16	ND (0.188)	--	ND (0.493)	--
603069	TA2-2-TR3-P789-SL1-S	3-02-00	ND (0.029)	--	0.741	0.381	ND (0.199)	--	ND (0.682)	--
603069	TA2-2-TR3-P789-SL2-S	3-02-00	ND (0.0259)	--	0.711	0.388	0.135	0.156	ND (0.648)	--
603069	TA2-2-TR3-P789-SL3-S	3-02-00	ND (0.0287)	--	0.652	0.349	ND (0.198)	--	ND (0.683)	--
603069	TA2-2-TR3-P789-SL4-S	3-02-00	ND (0.0308)	--	0.83	0.431	ND (0.202)	--	ND (0.705)	--
603069	TA2-2-TR3-P789-SL5-S	3-02-00	ND (0.0163)	--	ND (0.117)	--	ND (0.203)	--	ND (0.7)	--
602595	TA2-2-TR3-P10-SL1-S	8-12-99	ND (0.0419)		0.948	0.451	ND (0.203)		ND (0.588)	
602595	TA2-2-TR3-P10-SL2-S	8-12-99	ND (0.0426)		0.960	0.463	ND (0.204)		0.866	1.54
Overburden Soils										
600070	TA2-2-OVER-0001-SL2-S	4-16-98	0.0229	0.0271	0.772	0.614	ND (0.23)	--	ND (3.24)	--
600080	TA2-2-OVW4-0001-SL5-S	4-29-98	0.0284	0.0136	0.693	0.347	ND (0.194)	--	ND (1.7)	--
600082	TA2-2-OVW4-0001-SL8-S	5-04-98	ND (0.0305)	--	0.645	0.312	ND (0.225)	--	ND (3.14)	--
600082	TA2-2-SLPE-0001-SL3-S	5-04-98	ND (0.029)	--	0.688	0.387	ND (0.219)	--	ND (2.87)	--
600082	TA2-2-SLPE-0001-SL9-S	5-04-98	ND (0.0272)	--	0.664	0.347	ND (0.176)	--	ND (1.26)	--
600082	TA2-2-SLPE-SL14-000-S	5-04-98	ND (0.0321)	--	0.618	0.3	ND (0.228)	--	ND (3)	--
600276	TA2-2-SLPE-SL16-000-S	5-18-98	ND (0.0285)	--	0.672	0.323	ND (0.034)	--	ND (2.9)	--
600276	TA2-2-SLPE-SL19-000-S	5-18-98	0.0107	0.00238	0.73	0.349	ND (0.0371)	--	ND (3.2)	--
600276	TA2-2-SLPE-SL22-000-S	5-18-98	ND (0.0288)	--	0.715	0.338	ND (0.0325)	--	ND (2.85)	--
600276	TA2-2-SLPE-SL23-000-S	5-18-98	ND (0.0272)	--	0.671	0.321	ND (0.0326)	--	ND (2.91)	--
600276	TA2-2-SLPE-SL32-000-S	5-18-98	ND (0.0274)	--	0.736	0.35	ND (0.031)	--	ND (2.73)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
Record		Sample	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Number[a]	ER Sample ID[b]	Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
600276	TA2-2-SLPE-SL34-000-S	5-18-98	ND (0.0288)	--	0.738	1.31	ND (0.0337)	--	ND (2.96)	--
600492	TA2-2-SLPE-SL39-000-S	9-21-98	ND (0.03)	--	0.69	0.356	0.0812	0.139	0.81	0.486
600492	TA2-2-SLPE-SL41-000-S	9-21-98	ND (0.0335)	--	0.646	0.36	0.095	0.145	ND (0.518)	--
602100	TA2-2-SLPE-SL45-000-S	7-28-99	ND (0.0364)	--	0.871	0.466	ND (0.24)	--	ND (0.818)	--
602100	TA2-2-SLPE-SL46-000-S	7-28-99	ND (0.0335)	--	0.891	0.488	0.0993	0.194	ND (0.813)	--
600280	TA2-2-OVTE-SL03-000-S	5-26-98	ND (0.0273)	--	0.747	0.365	ND (0.203)	--	ND (2.88)	--
600280	TA2-2-OVTE-SL08-000-S	5-26-98	ND (0.0309)	--	0.713	0.373	ND (0.219)	--	ND (3.03)	--
600284	TA2-2-OVTE-SL11-000-S	6-01-98	ND (0.0447)	--	0.564	0.348	ND (0.28)	--	ND (2.4)	--
600284	TA2-2-OVTE-SL11-000-DUP	6-01-98	ND (0.041)	--	0.394	0.278	ND (0.248)	--	ND (2.13)	--
600291	TA2-2-OVA5-SL05-000-S	6-10-98	ND (0.0289)	--	0.659	0.325	ND (0.207)	--	ND (2.96)	--
600291	TA2-2-OVA5-SL11-000-S	6-10-98	ND (0.0309)	--	0.687	0.345	ND (0.226)	--	ND (3.14)	--
600291	TA2-2-OVA5-SL13-000-S	6-10-98	ND (0.027)	--	0.66	0.439	ND (0.207)	--	ND (2.97)	--
600460	TA2-2-OVD1-SL01-000-S	7-07-98	ND (0.0332)	--	0.784	0.451	ND (0.181)	--	ND (1.22)	--
600460	TA2-2-OVD2-SL02-000-S	7-07-98	ND (0.0384)	--	0.762	0.383	ND (0.2)	--	1.08	0.699
600464	TA2-2-OVD3-SL01-000-S	7-13-98	ND (0.0438)	--	0.86	0.456	ND (0.291)	--	ND (4.18)	--
600473	TA2-2-OVD4-SL03-000-S	8-17-98	0.0461	0.0287	0.674	0.327	ND (0.223)	--	0.659	0.477
600488	TA2-2-OVD7-SL02-000-S	9-14-98	0.0155	0.0281	0.706	0.611	ND (0.213)	--	0.76	0.414
600488	TA2-2-OVD8-SL02-000-S	9-14-98	ND (0.0269)	--	0.661	0.316	ND (0.194)	--	ND (0.66)	--
600497	TA2-2-I600-SORT-SEG-S	9-23-98	0.0384	0.0235	0.763	0.394	0.0265	0.148	0.911	0.654
600497	TA2-2-I607-SORT-SEG-S	9-23-98	0.0382	0.0248	0.682	0.387	ND (0.172)	--	ND (0.54)	--
600504	TA2-2-SLPE-SL44-000-S	11-03-98	ND (0.0325)	--	0.785	0.447	ND (0.203)	--	ND (0.542)	--
601608	TA2-2-OVB1-SL01-000-S	4-14-99	ND (0.0475)	--	0.844	0.424	0.159	0.206	ND (0.652)	--
601608	TA2-2-OVB1-SL02-000-S	4-14-99	ND (0.0516)	--	0.854	0.511	ND (0.26)	--	ND (0.637)	--
601729	TA2-2-OVB2-B301-000-S	4-22-99	ND (0.0301)	--	0.748	0.415	ND (0.22)	--	ND (0.738)	--
602091	TA2-2-OVA2-SL01-000-S	7-07-99	ND (0.0346)	--	0.942	0.507	ND (0.247)	--	ND (0.843)	--
602091	TA2-2-OVA3-SL01-000-S	7-07-99	ND (0.036)	--	0.831	0.496	ND (0.246)	--	ND (0.842)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
Record		Sample	Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Number[a]	ER Sample ID[b]	Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
602095	TA2-2-FILL-DIRT-1/2-S	7-19-99	ND (0.0292)	--	0.673	0.346	ND (0.205)	--	ND (0.712)	--
602095	TA2-2-FILL-DIRT-2/2-S	7-19-99	ND (0.0296)	--	ND (0.148)	--	ND (0.216)	--	ND (0.736)	--
602100	TA2-2-OVA1-SL01-000-S	7-28-99	ND (0.0267)	--	0.681	0.331	0.116	0.157	ND (0.655)	--
602100	TA2-2-OVA1-SL02-000-S	7-28-99	ND (0.0269)	--	0.826	0.424	ND (0.21)	--	ND (0.729)	--
602100	TA2-2-OVA1-SL03-000-S	7-28-99	ND (0.031)	--	0.91	0.432	ND (0.22)	--	ND (0.746)	--
602100	TA2-2-OVA1-SL04-000-S	7-28-99	ND (0.0337)	--	0.936	0.573	0.136	0.2	ND (0.876)	--
602100	TA2-2-OVA1-SL05-000-S	7-28-99	ND (0.0309)	--	ND (0.148)	--	0.114	0.173	ND (0.747)	--
602100	TA2-2-OVA1-SL06-000-S	7-28-99	ND (0.028)	--	0.774	1.06	ND (0.208)	--	ND (0.732)	--
602799	TA2-2-OVT1-P1-SL1-S	10-21-99	ND (0.0355)	--	0.759	0.416	ND (0.184)	--	ND (0.458)	--
602799	TA2-2-OVT1-P1-SL2-S	10-21-99	ND (0.0334)	--	ND (0.129)	--	ND (0.179)	--	ND (0.489)	--
602788	TA2-2-OVT1-P2-SL1-S	10-14-99	ND (0.0242)	--	0.705	0.363	ND (0.181)	--	ND (0.625)	--
602788	TA2-2-OVT1-P2-SL2-S	10-14-99	0.0180	0.0242	0.800	0.409	ND (0.194)	--	ND (0.664)	--
602788	TA2-2-OVT1-P3-SL1-S	10-14-99	ND (0.0253)	--	0.796	0.409	ND (0.192)	--	ND (0.661)	--
602788	TA2-2-OVT1-P3-SL2-S	10-14-99	ND (0.0251)	--	0.743	0.400	ND (0.109)	--	ND (0.650)	--
602782	TA2-2-OVT1-P4-SL1-S	9-22-99	ND (0.0366)	--	ND (0.157)	--	0.153	0.173	ND (0.54)	--
602101	TA2-2-OVT2-P12-SL1-S	8-03-99	ND (0.0358)	--	0.834	0.448	ND (0.23)	--	ND (0.816)	--
602101	TA2-2-OVT2-P12-SL2-S	8-03-99	ND (0.0274)	--	0.714	0.377	ND (0.199)	--	ND (0.67)	--
602920	TA2-2-OVT2-P10-SL1-S	11-11-99	ND (0.024)	--	0.722	0.375	0.0869	0.141	ND (0.606)	--
602810	TA2-2-OVT2-P9-SL1-S	11-15-99	ND (0.0318)	--	0.808	0.436	ND (0.215)	--	ND (0.753)	--
602931	TA2-2-OVT2-P8-SL1-S	11-23-99	ND (0.0266)	--	0.787	0.42	0.123	0.154	ND (0.674)	--
602965	TA2-2-OVT2-P8-SL1-S	1-03-00	ND (0.0382)	--	ND (0.151)	--	ND (0.2)	--	ND (0.546)	--
602965	TA2-2-OVT2-P7-SL1-S	1-03-00	ND (0.0307)	--	0.715	0.369	0.109	0.147	0.707	0.793
602966	TA2-2-OVT2-P5/1-SL1-S	1-03-00	0.0307	0.0282	0.738	0.568	ND (0.194)	--	ND (0.665)	--
602966	TA2-2-OVT2-P5/1-SL2-S	1-03-00	ND (0.0157)	--	0.774	0.891	ND (0.202)	--	ND (0.701)	--
602101	TA2-2-OVT3-P10-SL1-S	8-03-99	ND (0.0245)	--	0.709	0.38	ND (0.185)	--	ND (0.62)	--
602101	TA2-2-OVT3-P10-SL2-S	8-03-99	ND (0.0278)	--	0.906	0.439	ND (0.208)	--	ND (0.704)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
			Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
602101	TA2-2-OVT3-P10-SL3-S	8-03-99	ND (0.026)	--	0.691	0.345	ND (0.194)	--	ND (0.648)	--
603059	TA2-2-OVT3-P789-SL1-S	2-28-00	ND (0.0333)	--	0.647	0.388	ND (0.183)	--	0.404	0.399
603059	TA2-2-OVT3-P789-SL2-S	2-28-00	ND (0.0312)	--	ND (0.137)	--	0.163	0.151	0.812	0.74
602979	TA2-2-OVT3-P456-SL1-S	2-09-00	ND (0.0361)	--	0.731	0.379	ND (0.19)	--	ND (0.521)	--
602979	TA2-2-OVT3-P2/3-SL1-S	2-09-00	ND (0.0374)	--	0.861	0.449	ND (0.197)	--	0.328	0.405
602616	TA2-2-OV1-P6-SL1-S	9-07-99	ND (0.0372)	--	ND (0.158)	--	0.102	0.148	ND (0.446)	--
602605	TA2-2-EAST-FNCE-001-S	8-23-99	ND (0.0378)	--	0.961	0.511	**0.187**	0.2	ND (0.875)	--
Soils Removed Directly from Artifacts (Bin Soils)										
602973	TA2-2-P225-2C/F-BIN-S	1-24-00	0.0296	0.0247	0.709	0.858	0.131	0.16	ND (0.716)	--
602973	TA2-2-P225-3C/F-BIN-S	1-24-00	0.0764	0.0212	0.807	0.38	ND (0.198)	--	ND (0.71)	--
602795	TA2-2-COBL-GRIZ-001-S	10-20-99	ND (0.0405)	--	0.689	0.37	ND (0.213)	--	ND (0.579)	--
602599	TA2-2-COBL-GRIZ-TRA-S	8-18-99	ND (0.0343)	--	0.684	0.38	ND (0.199)	--	ND (0.526)	--
603071	TA2-2-1LAY-DOWN-BIN-S	3-07-00	ND (0.0172)	--	0.599	0.708	**0.274**	0.17	ND (0.727)	--
603071	TA2-2-2LAY-DOWN-BIN-S	3-07-00	ND (0.0305)	--	0.589	0.346	ND (0.211)	--	ND (0.72)	--
603071	TA2-2-3LAY-DOWN-BIN-S	3-07-00	ND (0.0306)	--	0.692	0.39	0.104	0.165	ND (0.741)	--
603071	TA2-2-4LAY-DOWN-BIN-S	3-07-00	ND (0.0289)	--	0.717	0.773	ND (0.203)	--	ND (0.718)	--
603071	TA2-2-5LAY-DOWN-BIN-S	3-07-00	0.012	0.0146	0.827	0.44	0.128	0.175	ND (0.773)	--
603071	TA2-2-6LAY-DOWN-BIN-S	3-07-00	ND (0.0335)	--	0.742	0.379	ND (0.212)	--	ND (0.736)	--
603071	TA2-2-7LAY-DOWN-BIN-S	3-07-00	ND (0.0391)	--	ND (0.166)	--	0.0903	0.172	ND (0.56)	--
603071	TA2-2-8LAY-DOWN-BIN-S	3-07-00	ND (0.036)	--	0.759	0.426	ND (0.193)	--	0.869	0.481
603071	TA2-2-9LAY-DOWN-BIN-S	3-07-00	ND (0.0388)	--	0.802	0.453	ND (0.21)	--	ND (0.584)	--
603187	TA2-2-PIT-BURM-MIX-E-S	6-15-00	ND (0.0276)	--	0.748	0.692	ND (0.195)	--	ND (0.699)	--
603187	TA2-2-PIT-BURM-MIX-N-S	6-15-00	ND (0.0262)	--	0.68	0.363	0.0863	0.152	ND (0.667)	--
603187	TA2-2-PIT-BURM-MIX-S-S	6-15-00	ND (0.0273)	--	0.696	0.384	ND (0.194)	--	ND (0.667)	--
603187	TA2-2-PIT-BURM-MIX-W-S	6-15-00	ND (0.0264)	--	0.706	1.21	ND (0.196)	--	ND (0.667)	--
603195	TA2-2-CWLF-COBL-GRIZ-1	6-22-00	0.0345	0.0336	0.782	0.404	0.0826	0.154	ND (0.542)	--

Refer to footnotes at end of table.

Table 5.6.3-8 (Concluded)
Summary of SWMU 2 Excavated Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–July 2000
(On-site Laboratory)

Sample Attributes			Activity (pCi/g)							
Record Number[a]	ER Sample ID[b]	Sample Date	Cesium-137 Result	Cesium-137 Error[c]	Thorium-232 Result	Thorium-232 Error[c]	Uranium-235 Result	Uranium-235 Error[c]	Uranium-238 Result	Uranium-238 Error[c]
603195	TA2-2-CWLF-COBL-GRIZ-2	6-22-00	ND (0.0169)	--	ND (0.114)	--	0.0971	0.149	ND (0.665)	--
603195	TA2-2-CWLF-COBL-GRIZ-3	6-22-00	0.0256	0.0227	0.746	0.395	ND (0.187)	--	ND (0.515)	--
603195	TA2-2-CWLF-COBL-GRIZ-5	6-22-00	0.0329	0.024	0.752	0.4	ND (0.188)	--	ND (0.673)	--
603195	TA2-2-CWLF-COBL-GRIZ-6	6-22-00	0.023	0.0257	ND (0.124)	--	ND (0.192)	--	ND (0.7)	--
603195	TA2-2-CWLF-COBL-GRIZ-7	6-22-00	0.0386	0.0147	0.973	0.737	ND (0.211)	--	ND (0.757)	--
603195	TA2-2-CWLF-COBL-GRIZ-8	6-22-00	ND (0.0217)	--	0.806	0.436	0.119	0.144	ND (0.512)	--
603195	TA2-2-CWLF-COBL-GRIZ-9	6-22-00	0.0332	0.022	0.838	0.436	ND (0.182)	--	ND (0.501)	--
603195	TA2-2-CYLI-NDER-BRM-S	6-22-00	ND (0.0326)	--	0.827	0.415	ND (0.172)	--	ND (0.463)	--
Background Soil Activities—North Area[d]			0.084[e]	NA	1.54	NA	0.18	NA	1.3	NA
Quality Assurance/Quality Control Samples (pCi/mL)										
600282	TA2-2-TR5-0001-EB	6-01-98	ND (0.0443)	--	ND (0.300)	--	ND (0.276)	--	ND (0.688)	--
600458	TA2-2-TRD1-0006-EB	7-06-98	ND (0.0467)	--	ND (0.360)	--	ND (0.313)	--	ND (0.641)	--
600471	TA2-2-TRD6-0015-EB	8-11-98	ND (0.0173)	--	ND (0.111)	--	ND (0.1)	--	ND (0.251)	--
601138	TA2-2-TRC7-0003-000EB	11-30-98	ND (0.0204)	--	ND (0.138)	--	ND (0.0952)	--	ND (0.225)	--

Note: Values in **bold** exceed background soil activities.
[a]Analysis request/chain-of-custody record.
[b]Sample naming scheme is provided in Table 5.6.2-1.
[c]Two standard deviations about the mean detected activity.
[d]From Dinwiddie September 1997.
[e]The more conservative, lower subsurface background activity is used as a benchmark for consistency with current risk screening assessment methodology.
ER = Environmental Restoration.
ID = Identification.
NA = Not applicable.
ND ( ) = Not detected at or above the reported value, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
SWMU = Soil Waste Management Unit.
-- = Error not provided for nondetect results.

Table 5.6.3-9
Gamma Spectroscopy Minimum Detectable Activities Used for SWMU 2
Excavated Soil and Excavation Confirmatory Soil Sampling
March 1998–August 2000
(On-site Laboratory)

Radionuclide	Soil Sample MDA Range (pCi/g)
Actinium-228	0.0578–1.14
Americium-241	0.148–0.719
Antimony-122	0.0239–0.382
Antimony-124	0.0197–0.0539
Antimony-125	0.0579–0.135
Barium-133	0.0351–0.0824
Beryllium-7	0.179–0.443
Bismuth-212	0.196–0.543
Bismuth-214	0.0315–0.087
Cadmium-109	0.0315–2.06
Cadmium-115	0.0746–1.02
Cerium-139	0.0212–0.0414
Cerium-141	0.0288–0.0832
Cerium-144	0.168–0.341
Cesium-134	0.028–0.0606
Cesium-137	0.0117–0.0522
Cobalt-56	0.0143–0.0583
Cobalt-57	0.0154–0.0446
Cobalt-58	0.0194–0.0562
Cobalt-60	0.0257–0.0729
Chromium-51	0.134–0.447
Europium-152	0.0637–0.133
Europium-154	0.129–0.331
Europium-155	0.0517–0.205
Gadolinium-153	0.0566–0.151
Iodine-131	0.0193–0.0702
Iridium-192	0.0193–0.0469
Iron-59	0.0514–0.138
Lead-210	3.82–53.2
Lead-211	0.612–1.38
Lead-212	0.0295–0.23
Lead-214	0.0346–0.131
Manganese-52	0.0267–0.122
Manganese-54	0.0115–0.0633
Mercury-203	0.0234–0.0523
Molybdenum-99	0.219–2.16
Neodymium-147	0.0929–2.55
Neptunium-237	0.12–3.02
Nickel-57	0.035–2.9
Niobium-95	0.0661–1.21
Plutonium-239	185–642
Potassium-40	0.158–1.33
Protactinium-231	0.981–3.52

Refer to footnotes at end of table.

Table 5.6.3-9 (Concluded)
Gamma Spectroscopy Minimum Detectable Activities Used for SWMU 2
Excavated Soil and Excavation Confirmatory Soil Sampling
March 1998–August 2000
(On-site Laboratory)

Radionuclide	Soil Sample MDA Range (pCi/g)
Protactinium-233	0.0407–0.0943
Radium-223	0.116–0.432
Radium-224	0.04–0.241
Radium-226	0.376–1.03
Radium-228	0.0959–0.261
Radon-219	0.189–0.646
Ruthenium-103	0.021–0.0491
Ruthenium-106	0.114–0.509
Silver-108	0.0266–0.0684
Silver-110	0.0219–0.0629
Sodium-22	0.0166–0.0729
Sodium-24	0.0526–395
Strontium-85	0.0222–0.0695
Tantalum-182	0.0973–0.298
Tantalum-183	0.0805–1.6
Technicium-99	0.116–1.36
Thallium-201	0.0568–1.27
Thallium-207	8.95–26.1
Thallium-208	0.0447–0.143
Thorium-227	0.211–0.728
Thorium-228	0.257–0.898
Thorium-229	0.096–0.368
Thorium-232	0.0904–0.26
Tin-113	0.0218–0.0639
Uranium-235	0.0819–0.332
Uranium-238	0.262–3.03
Xenon-133	0.0577–1.8
Yttrium-88	0.016–0.0504
Zinc-65	0.0656–0.197
Zirconium-95	0.0366–0.105

MDA = Minimum detectable activity.
pCi/g = Picocurie(s) per gram.
SWMU = Solid Waste Management Unit.

Table 5.6.3-10
Summary of SWMU 2 Excavated Soil Sampling Tritium Analytical Results
April 1998–October 1999
(On-site Laboratory, except where noted)

Sample Attributes			Activity (pCi/L)[a]	
Record Number[b]	ER Sample ID[c]	Sample Date	Result	Error[d]
600009	TA2-2-ACF2-0001-15-S	3-12-98	**208,000**	103,600
600011	TA2-2-ACF3-0001-12-S	3-20-98	ND (110,400)	--
600040	TA2-2-ACF3-0001-SL1-S	3-23-98	**160,600**	163,400
600040	TA2-2-ACF4-0001-SL1-S	3-24-98	**164,800**	244,000
600042	TA2-2-ACF4-0001-12-S	3-25-98	**165,800**	168,200
600044	TA2-2-ACF4-0001-SL5-S	3-26-98	**51,400**	137,800
600045	TA2-2-ACF1-0001-SL2-S	4-01-98	**32,800**	131,600
600045	TA2-2-PTW1-0001-10-S	4-01-98	**510,000**	182,000
600060	TA2-2-PW12-0001-SL7-S	4-07-98	**113,400**	158,800
600063	TA2-2-PTW2-0001-12-S	4-09-98	**366,000**	184,200
600065	TA2-2-ACF2-0001-SL4-S	4-13-98	ND (170,200)	--
600065	TA2-2-PTW3-0001-12-S	4-13-98	**45,200**	134,800
600068	TA2-2-PTW3-0001-SL4-S	4-14-98	ND (159,200)	--
600070	TA2-2-OVER-0001-SL2-S	4-16-98	**190,600**	185,600
600073	TA2-2-PTW4-15-S	4-20-98	**132,400**	144,800
600075	TA2-2-PTW4-SL10-000-S	4-23-98	**67,000**	165,400
600075	TA2-2-PTW4-SL14-000-S	4-23-98	**210,000**	222,000
600075	TA2-2-PTW4-SL15-000-S	4-23-98	**162,800**	200,000
600080	TA2-2-OVW4-0001-SL5-S	4-29-98	**15,840**	184,600
600082	TA2-2-OVW4-0001-SL8-S	5-04-98	**18,480**	130,000
600082	TA2-2-SLPE-SL14-000-S	5-04-98	ND (175,200)	--
600082	TA2-2-SLPE-0001-SL3-S	5-04-98	ND (175,200)	--
600082	TA2-2-SLPE-0001-SL9-S	5-04-98	ND (175,200)	--
600084	TA2-2-TRE1-SL06-000-S	5-06-98	**342,000**	304,000
600084	TA2-2-TRE1-SL13-000-S	5-06-98	**514,000**	292,000
600086	TA2-2-TRE2-SL07-000-S	5-11-98	**1,574,000**	452,000
600275	TA2-2-TRE4-0001-000-S	5-12-98	ND (31,400)	--
600276	TA2-2-SLPE-SL16-000-S	5-18-98	**52,400**	130,400
600276	TA2-2-SLPE-SL22-000-S	5-18-98	**79,400**	126,400
600276	TA2-2-SLPE-SL23-000-S	5-18-98	**41,800**	126,600
600276	TA2-2-SLPE-SL19-000-S	5-18-98	**94,600**	145,400
600276	TA2-2-SLPE-SL32-000-S	5-18-98	**74,000**	122,800
600276	TA2-2-SLPE-SL34-000-S	5-18-98	**62,000**	137,000
600278	TA2-2-TRE3-SL07-000-S	5-21-98	**1,220,000**	394,000
600278	TA2-2-TRE4-SL10-000-S	5-21-98	**1,182,000**	406,000
600280	TA2-2-OVTE-SL03-000-S	5-26-98	**250,000**	185,800
600280	TA2-2-OVTE-SL08-000-S	5-26-98	**76,200**	159,800
600284	TA2-2-TRE5-SL17-000-S	6-01-98	**610,000**	312,000
600284	TA2-2-TRE5-SL08-000-S	6-01-98	**550,000**	320,000
600284	TA2-2-OVTE-SL11-000-S	6-01-98	**119,600**	202,000
600284	TA2-2-OVTE-SL11-000-DUP	6-01-98	**208,000**	252,000

Refer to footnotes at end of table.

Table 5.6.3-10 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Tritium Analytical Results
April 1998–October 1999
(On-site Laboratory, except where noted)

Sample Attributes			Activity (pCi/L)[a]	
Record Number[b]	ER Sample ID[c]	Sample Date	Result	Error[d]
600288	TA2-2-TRE6-SL09-000-S (off-site laboratory)	6-08-98	**79,300**	**1,580**
600289	TA2-2-TRE6-SL22-000-S	6-08-98	**152,000**	200,000
600289	TA2-2-TRE6-SL22-000-DUP	6-08-98	**167,000**	202,000
600289	TA2-2-TRE6-SL09-000-S	6-08-98	**156,600**	190,200
600291	TA2-2-OVA5-SL05-000-S	6-10-98	**115,600**	164,600
600291	TA2-2-OVA5-SL11-000-S	6-10-98	ND (40,800)	--
600291	TA2-2-OVA5-SL13-000-S	6-10-98	**121,000**	204,000
600295	TA2-2-TRE7-SL25-000-S	6-17-98	**30,400**	228,000
600295	TA2-2-TRE7-SL13-000-S	6-17-98	**186,800**	226,000
600295	TA2-2-TRE7-SL08-000-S	6-17-98	**206,000**	220,000
600298	TA2-2-TRE7-SL55-000-S	6-23-98	**147,000**	188,000
600298	TA2-2-TRE7-SL37-000-S	6-23-98	**134,600**	193,000
600298	TA2-2-TRE7-SL49-000-S	6-23-98	**145,800**	187,800
600300	TA2-2-TRE8-SL01-000-S	6-25-98	**128,600**	178,000
600300	TA2-2-TRE8-SL14-000-S	6-25-98	**167,600**	160,200
600302	TA2-2-TRE8-SL07-000-S	6-29-98	**188,000**	157,200
600302	TA2-2-TRE8-SL21-000-S	6-29-98	**119,200**	135,600
600302	TA2-2-TRE8-SL29-000-S	6-29-98	**204,000**	154,600
600460	TA2-2-OVD1-SL01-000-S	7-07-98	**23,800**	110,800
600460	TA2-2-OVD2-SL02-000-S	7-07-98	ND (150,200)	--
600460	TA2-2-ACF5-SL06-000-S	7-07-98	**7,060**	139,200
600462	TA2-2-TRD1-SL02-000-S	7-07-98	**316,000**	218,000
600462	TA2-2-TRD1-SL06-000-S	7-07-98	**278,000**	173,000
600462	TA2-2-TRD1-SL09-000-S	7-07-98	**218,000**	230,000
600462	TA2-2-TRD1-SL12-000-S	7-07-98	**288,000**	175,600
600464	TA2-2-TRD2-SL01-000-S	7-13-98	**1,466,000**	414,000
600464	TA2-2-TRD2-SL05-000-S	7-13-98	**1,718,000**	430,000
600464	TA2-2-OVD3-SL01-000-S	7-13-98	**28,600**	173,600
600466	TA2-2-TRD3-SL03-000-S	7-20-98	**1,238,000**	356,000
600466	TA2-2-TRD3-SL06-000-S	7-20-98	**962,000**	332,000
600466	TA2-2-TRD3-SL12-000-S	7-20-98	**1,062,000**	344,000
600469	TA2-2-TRD4-SL03-000-S	8-10-98	**580,000**	224,000
600469	TA2-2-TRD4-SL03-000-DUP	8-10-98	**620,000**	240,000
600469	TA2-2-TRD4-SL07-000-S	8-10-98	**516,000**	254,000
600469	TA2-2-TRD4-SL14-000-S	8-10-98	**544,000**	238,000
600469	TA2-2-TRD4-SL05-000-S	8-10-98	**129,600**	152,000
600469	TA2-2-TRD5-SL05-000-DUP	8-10-98	**138,800**	178,600
600473	TA2-2-TRD6-SL19-000-S	8-17-98	ND (30,600)	--
600473	TA2-2-TRD6-SL23-000-S	8-17-98	**68,800**	220,000
600473	TA2-2-TRD6-SL15-000-S	8-17-98	**162,400**	222,000
600473	TA2-2-TRD6-SL03-000-S	8-17-98	ND (30,600)	--

Refer to footnotes at end of table.

Table 5.6.3-10 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Tritium Analytical Results
April 1998–October 1999
(On-site Laboratory, except where noted)

Sample Attributes			Activity (pCi/L)[a]	
Record Number[b]	ER Sample ID[c]	Sample Date	Result	Error[d]
600473	TA2-2-OVD4-SL03-000-S	8-17-98	**55,400**	220,000
600473	TA2-2-TRD6-SL08-000-S	8-17-98	**314,000**	274,000
600488	TA2-2-OVD8-SL02-000-S	9-14-98	**196,800**	282,000
600488	TA2-2-TRD7-SL03-000-S	9-14-98	**1,040,000**	344,000
600488	TA2-2-TRD7-SL11-000-S	9-14-98	**1,148,000**	404,000
600488	TA2-2-TRD7-SL13-000-S	9-14-98	**1,536,000**	446,000
600488	TA2-2-TRD7-SL23-000-S	9-14-98	**896,000**	354,000
600488	TA2-2-OVD7-SL02-000-S	9-14-98	**284,000**	292,000
600492	TA2-2-SLPE-SL39-000-S	9-14-98	**87,000**	165,400
600492	TA2-2-SLPE-SL41-000-S	9-14-98	ND (22,000)	--
600501	TA2-2-TRD8-SL04-000-S	10-20-98	**264,000**	226,000
600501	TA2-2-TRD8-SL01-049-S	10-20-98	**162,400**	228,000
600501	TA2-2-TRD8-SL45-000-S	10-20-98	**416,000**	266,000
600501	TA2-2-TRD8-SL33-000-S	10-20-98	**612,000**	284,000
600501	TA2-2-TRD8-SL16-000-S	10-20-98	**566,000**	286,000
600501	TA2-2-TRD8-SL27-000-S	10-20-98	**414,000**	274,000
600504	TA2-2-TRC9-SL19-000-S	11-03-98	**624,000**	734,000
600504	TA2-2-SLPE-SL44-000-S	11-03-98	**240,000**	756,000
600504	TA2-2-TRC9-SL01-000-S	11-03-98	**31,800**	688,000
600504	TA2-2-TRC9-SL05-000-S	11-03-98	ND (68,000)	--
601133	TA2-2-TRC9-SL24-000-S	11-17-98	**350,000**	184,200
601133	TA2-2-TRC9-SL42-000-S	11-17-98	**462,000**	226,000
601133	TA2-2-TRC9-SL57-000-S	11-17-98	**314,000**	186,600
601133	TA2-2-TRC9-SL71-000-S	11-17-98	**254,000**	206,000
601140	TA2-2-TRC8-SL11-000-S	1-13-99	**918,000**	368,000
601140	TA2-2-TRC7-SL21-000-S	1-13-99	**148,000**	214,000
601140	TA2-2-TRC7-SL01-000-S	1-13-99	**354,000**	270,000
601140	TA2-2-TRC8-SL17-000-S	1-13-99	**410,000**	296,000
601140	TA2-2-TRC9-SL83-000-S	1-13-99	**230,000**	284,000
601140	TA2-2-TRC8-SL04-000-S	1-13-99	**848,000**	380,000
601141	TA2-2-TRC6-SL01-000-S	1-13-99	**336,000**	214,000
601141	TA2-2-TRC6-SL02-000-S	1-13-99	**268,000**	202,000
601141	TA2-2-TRC6-SL03-000-S	1-13-99	**212,000**	185,600
601141	TA2-2-TRC6-SL04-000-S	1-13-99	**264,000**	185,200
601142	TA2-2-TRC6-SL05-000-S	1-14-99	**128,400**	182,600
601142	TA2-2-TRC6-SL06-000-S	1-14-99	**376,000**	202,000
601142	TA2-2-TRC6-SL07-000-S	1-14-99	**298,000**	222,000
601152	TA2-2-TRC5-SL01-000-S	1-28-99	**226,000**	200,000
601152	TA2-2-TRC5-SL02-000-S	1-28-99	**136,200**	180,000
601152	TA2-2-TRC5-SL03-000-S	1-28-99	**184,200**	202,000
601152	TA2-2-TRC5-SL04-000-S	1-28-99	**188,200**	192,000
601153	TA2-2-TRC5-SL05-000-S	2-01-99	**260,000**	312,000

Refer to footnotes at end of table.

Table 5.6.3-10 (Continued)
Summary of SWMU 2 Excavated Soil Sampling Tritium Analytical Results
April 1998–October 1999
(On-site Laboratory, except where noted)

Sample Attributes			Activity (pCi/L)[a]	
Record Number[b]	ER Sample ID[c]	Sample Date	Result	Error[d]
601153	TA2-2-TRC5-SL06-000-S	2-01-99	**142,200**	314,000
601153	TA2-2-TRC5-SL07-000-S	2-01-99	**268,000**	364,000
601155	TA2-2-TRC5-SL08-000-S	2-02-99	**290,000**	310,000
601155	TA2-2-TRC5-SL09-000-S	2-02-99	**400,000**	358,000
601155	TA2-2-TRC5-SL10-000-S	2-02-99	**135,000**	324,000
601156	TA2-2-TRC5-SL11-000-S	2-03-99	**348,000**	260,000
601156	TA2-2-TRC5-SL12-000-S	2-03-99	**328,000**	298,000
601156	TA2-2-TRC5-SL13-000-S	2-03-99	**184,600**	264,000
601593	TA2-2-TRC4-SL01-000-S	3-09-99	**89,400**	181,200
601593	TA2-2-TRC4-SL02-000-S	3-09-99	**85,800**	146,600
601593	TA2-2-TRC4-SL03-000-S	3-09-99	**80,200**	188,800
601593	TA2-2-TRC4-SL04-000-S	3-09-99	ND (31,000)	--
601593	TA2-2-TRC4-SL05-000-S	3-09-99	ND (31,000)	--
601593	TA2-2-TRC4-SL06-000-S	3-09-99	**44,800**	156,600
601593	TA2-2-TRC4-SL07-000-S	3-09-99	**11,820**	181,200
601593	TA2-2-TRC4-SL08-000-S	3-09-99	ND (31,000)	--
601597	TA2-2-TRC3-SL01-000-S	3-10-99	**63,200**	183,400
601597	TA2-2-TRC3-SL02-000-S	3-11-99	**91,200**	176,200
601597	TA2-2-TRC3-SL03-000-S	3-11-99	**136,400**	175,400
601597	TA2-2-TRC3-SL04-000-S	3-11-99	**135,200**	183,600
601597	TA2-2-TRC3-SL05-000-S	3-11-99	**135,400**	192,000
601597	TA2-2-TRC3-SL06-000-S	3-11-99	**195,600**	198,000
601599	TA2-2-TRC3-SL10-000-S	3-22-99	**232,000**	172,600
601599	TA2-2-TRC3-SL11-000-S	3-22-99	**216,000**	210,000
601599	TA2-2-TRC3-SL12-000-S	3-22-99	**184,400**	195,000
601599	TA2-2-TRC3-SL13-000-S	3-22-99	**242,000**	224,000
601599	TA2-2-TRC3-SL14-000-S	3-22-99	**244,000**	204,000
601599	TA2-2-TRC3-SL15-000-S	3-22-99	**290,000**	216,000
601599	TA2-2-TRC3-SL16-000-S	3-22-99	**256,000**	222,000
602607	TA2-2-TR2-EAST-FNCE-002-S (off-site laboratory)	8-23-99	**75,500**	1,500
602607	TA2-2-TR2-EAST-FNCE-002-DU (off-site laboratory)	8-23-99	**72,000**	1,430
602607	TA2-2-TR2-P12A-SL6-S (off-site laboratory)	8-23-99	**65,700 J**	1,310
602607	TA2-2-TR2-P12A-SL6-DU (off-site laboratory)	8-23-99	**71,000 J**	1,410
602797	TA2-2-COBL-GRIZ-006-S (off-site laboratory)	10-20-99	**17,2000**	2,100

Refer to footnotes at end of table.

Table 5.6.3-10 (Concluded)
Summary of SWMU 2 Excavated Soil Sampling Tritium Analytical Results
April 1998–October 1999
(On-site Laboratory, except where noted)

Sample Attributes			Activity (pCi/L)[a]	
Record Number[b]	ER Sample ID[c]	Sample Date	Result	Error[d]
602797	TA2-2-TRB3-SL16-006-S (off-site laboratory)	10-20-99	**20,300**	736
602797	TA2-2-TRC9-SL83-006-S (off-site laboratory)	10-20-99	**46,100**	1,090
Background Soil Activity[e]			420	NA
Quality Assurance/Quality Control Samples (pCi/L)				
600059	TA2-2-PTW1-EB (off-site laboratory)	4-06-98	ND (171)	--
600458	TA2-2-TRD1-00006-EB	7-06-98	ND (467)	--
600471	TA2-2-TRD6-0015-EB	8-11-98	ND (434)	--
600495	TA2-2-TRD8-0025-EB	9-21-98	ND (315)	--
601138	TA2-2-TRC7-0003-000-EB	11-30-98	ND (374)	--

Note: Values in **bold** exceed background soil activity.
[a]Off-site laboratory analyses performed by tritium distillation method. On-site laboratory analyses performed by liquid scintillation counting method and pCi/g values converted to pCi/L assuming a soil density of 1 g/cubic centimeter and a soil moisture of 5 percent.
[b]Analysis request/chain-of-custody record.
[c]Sample naming scheme is provided in Table 5.6.2-1.
[d]Two standard deviations about the mean detected activity.
[e]From Tharp February 1999.

ER	= Environmental Restoration.
ID	= Identification.
J	= Estimated value. See Data Validation report.
NA	= Not applicable.
ND ( )	= Not detected above the minimum detectable activity, shown in parentheses.
pCi/g	= Picocurie(s) per gram.
pCi/L	= Picocurie(s) per liter.
S	= Soil sample.
SWMU	= Solid Waste Management Unit.
--	= Error not provided for nondetect results.

Table 5.6.3.1-1
Comparison of Excavated Soil Analytical Results to Background and Preliminary Remediation Goal Values

COC Type	Number of Samples[a]	COC	NMED Approved Background Concentration[b] (mg/kg)	Preliminary Remediation Goal Concentration (mg/kg)	Maximum Concentration (mg/kg)	Average Concentration[c] (mg/kg)	Number of Samples Exceeding Background Concentration[d]	Number of Samples Exceeding PRG Concentration[e]
Metals	356 environmental	Arsenic	4.4	1.9	8.3	2.94	8	294
	368 environmental	Barium	200	509	8,100	253.2	134	12
	368 environmental	Beryllium	0.80	206	4.20	0.44	6	0
	368 environmental	Cadmium	0.9	209	740	13.13	201	6
	368 environmental	Chromium	12.8	1,590	460	14.80	104	0
	368 environmental	Lead	11.2	2,000	620	20.28	94	0
	368 environmental	Mercury	<0.1	9.96	180	1.94	200	7
	368 environmental	Nickel	25.4	3,570	400	16.16	15	0
	354 environmental	Selenium	<1	5.89	250	1.38	29	3
	355 environmental	Silver	<1	1,550	110	1.52	61	0
	318 environmental	Uranium	2.3	102	4.50	1.11	4	0
Radionuclides[f]	453 environmental	Cs-137	0.084	22.1	0.247	NA	3	0
	453 environmental	Th-232	1.54	4.45	3.58	NA	1	0
	453 environmental	U-235	0.18	88.1	3.28	NA	17	0
	453 environmental	U-238	1.3	491	208	NA	10	0
	218 environmental	Tritium	420 pCi/L[g] (0.021pCi/g)	59,600,000 pCi/L (2,980 pCi/g)	1,718,000 pCi/L (85.9 pCi/g)	NA	180	0

[a]Number of samples includes duplicates and splits.
[b]From Dinwiddie September 1997.
[c]Average concentration includes all samples. For nondetect results, the MDL is used to calculate the average.
[d]Includes samples with nondetect results where the MDA or MDL exceeds the approved background limit.
[e]Includes samples where the method detection limit exceeds the PRG.
[f]An average MDA is not calculated because of the variability in instrument counting error and the number of reported nondetect activities.
[g]From Tharp February 1999.

COC = Constituent of concern.
MDA = Minimum detectable activity.
MDL = Method detection limit.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
PRG = Preliminary remediation goal.

exceeding the PRGs and background values are the "bin-soils," i.e., soil scraped directly off artifacts.

The final risk assessment results show that if all the excavated soil, including the bin-soils, are used as backfill and covered with a minimum of 5 feet (1.5 meters) of clean fill, there would be no adverse effects to potential human or ecological receptors (Section 5.9.2.2). Therefore, all excavated soil was determined to be appropriate for use as backfill material for the excavation.

5.7 VCM Confirmatory Activities

5.7.1 Final Excavation Geophysical Survey

Between March and August 2000, three verification surveys were performed by MDM Services, Inc. in the final excavation using an EM-61 high-precision metal locator (Figure 5.7.1-1) to determine if buried material remained (MDM Services, Inc. February 2001). The first verification survey indicating some small remaining anomalies is shown in Figure 5.7.1-2. These areas were subsequently checked with a Schonstadt metal detector by technicians and excavated by hand. Several resurveys and localized excavation were conducted to ensure that the largest buried items were removed. A final EM-61 survey of the excavation conducted in July-August 2000 indicated no significant buried debris remained (MDM Services, Inc. February 2001). Correlation between the debris excavated and the EM-61 response verified that only small bits of scrap metal remained. A map of the final survey is shown in Figure 5.7.1-3.

5.7.2 Confirmatory Soil Sampling

In August 2000, following the final geophysical survey, VCM confirmatory soil samples were collected from the excavation floor and sidewalls (Figure 5.7.2-1). These were collected from undisturbed, native material. Sampling activities were performed in accordance with the rationale and procedures described in the SWMU 2 SAP (SNL/NM February 1998b). SNL/NM chain-of-custody and sample documentation procedures were followed for all samples collected.

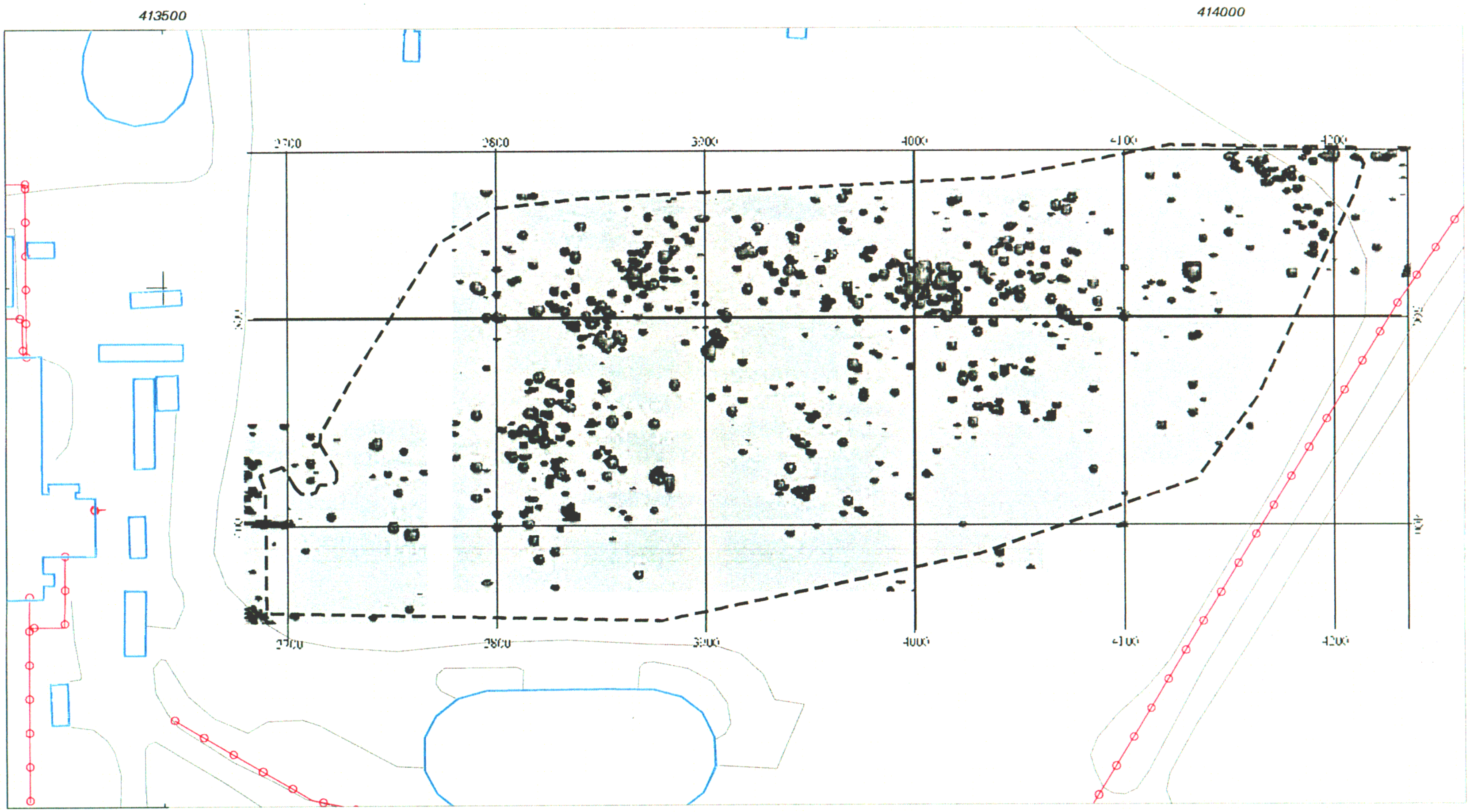
Samples were collected on 50-foot centers using the grid established for the final geophysical survey. Details of the identification nomenclature are provided in Table 5.6.2-1. Samples from the excavation floor were collected from 0.5–1.0 feet below grade. Samples from the excavation sidewall were collected from 1.0–1.5 feet laterally into the wall halfway up the excavation side.

A total of 58 soil samples (including duplicates) were collected from the SWMU 2 excavation floor and sidewalls in August 2000. The confirmatory data set also includes soil samples from the floors of the four W-Pits and four of the five ACF Pits. Because these pits were adjacent to the site haul roads, they were excavated separately, sampled, and following an informal data review with NMED, backfilled for safety reasons. Pit ACF-5 was excavated concurrently with disposal cell E-8 and was not sampled separately. The ACF-5 location is within the landfill proper and was included in the confirmatory sampling grid.

All confirmatory soil samples from the excavation were analyzed at the off-site laboratory (GEL) for RCRA metals plus beryllium, nickel, and uranium by EPA Methods 6010/7000 and tritium by

Figure 5.7.1-1
Geophysical Surveying in the SWMU 2 Excavation

MAPID=010094 12/22/00 SNL GIS ORG. 6135 DHelfrich dh010094.aml



Legend

Road / Parking
Fence
Building / Structure
SWMU 2 Boundary

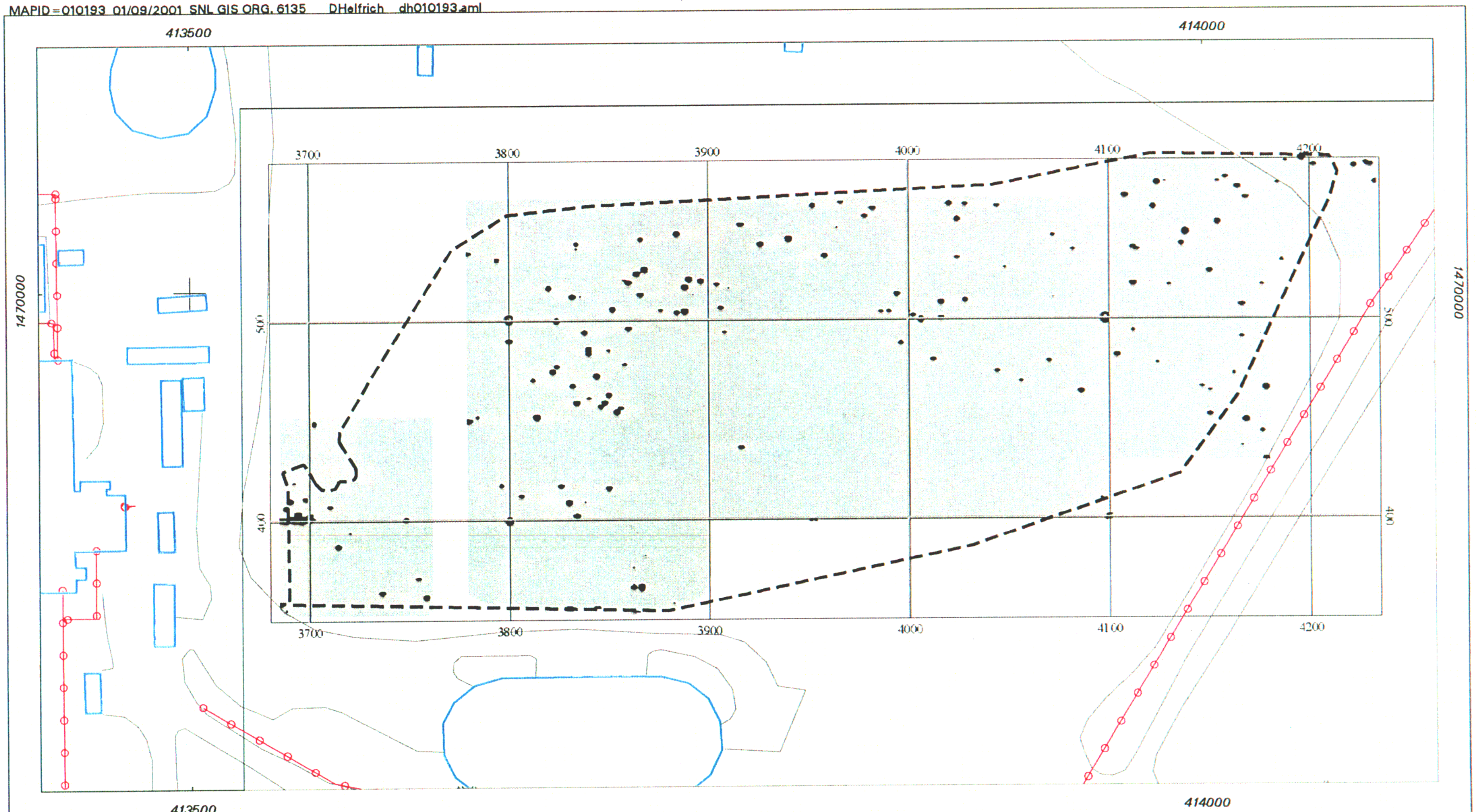
0 40 80
Scale in Feet

0 9.6 19.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.7.1-2
First Electromagnetic (EM-61) Verification Survey in VCM Excavation, SWMU 2 March, 2000

MAPID=010193 01/09/2001 SNL GIS ORG. 6135 DHelfrich dh010193.aml



Legend

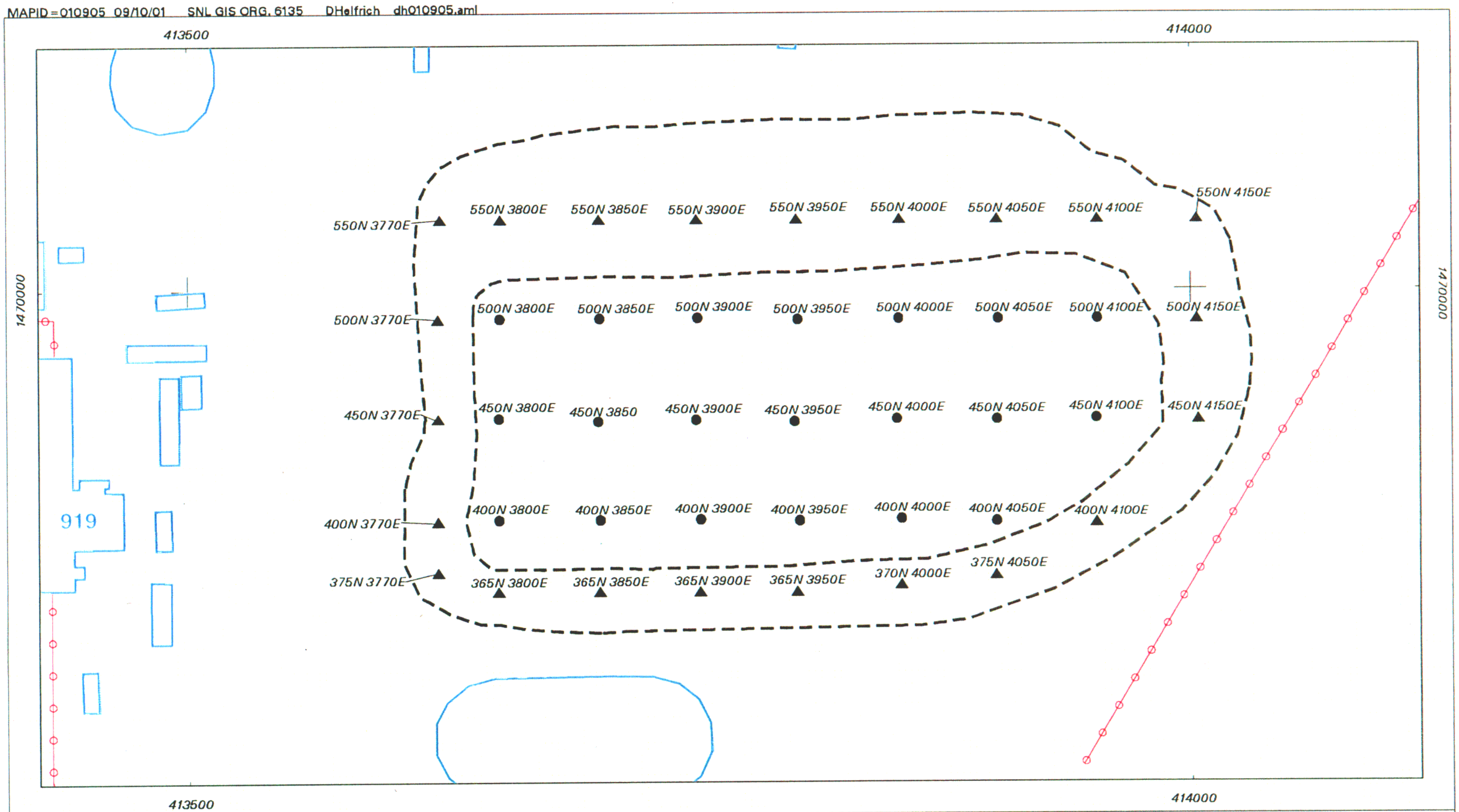
- Road / Parking
- Fence
- Building / Structure
- SWMU 2 Boundary

0 40 80
Scale in Feet

0 9.6 19.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.7.1-3
Final Electromagnetic (EM-61) Verification Survey in VCM Excavation, SWMU 2 July-August, 2000



Legend

- ● Floor Verification Sample
- ▲ Sidewall Verification Sample
- Unpaved Road / Parking
- Fence
- Building / Structure
- Final Excavation Limit / Floor

0 40 80
Scale in Feet

0 9.6 19.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Figure 5.7.2-1
Location of Final VCM Verification Soil Samples, SWMU 2, August 2000

EPA Method 906.0. Gamma spectroscopy analyses were performed at the SNL/NM RPSD Laboratory. The results are discussed below.

5.7.2.1 QA/QC Samples

QA/QC samples were collected at an approximate frequency of one per 10 field samples. These included duplicates, MS/MSD, equipment blanks, and trip blanks (for VOCs only). Annex 5-E contains the data validation reports for all soil samples collected. The data validation results and any problems identified with QA/QC samples, are discussed in Section 5.7.4.

5.7.3 Confirmatory Soil Sampling Analytical Results

<u>VOCs</u>

Table 5.7.3-1 presents the analytical results for the VOC analyses for soil samples collected from the bases of the excavated ACF and W-Pits. No samples for VOC analyses were collected in the final VCM excavation. A total of three VOC compounds were detected in the 15 samples analyzed. Acetone (ND to 19 µg/kg) was detected in four samples; methylene chloride (ND to 2.9 J µg/kg) in two samples; and toluene (ND to 1 J µg/kg) in one sample. The low concentrations of these compounds probably indicate laboratory contamination rather than a release. The MDLs for these analyses are provided in Table 5.6.3-2.

<u>RCRA Metals plus Beryllium, Nickel, and Uranium</u>

Table 5.7.3-2 presents the analytical results for the RCRA metals plus beryllium, nickel, and uranium analysis of soil samples collected from the VCM excavation floor and sidewalls in August 2000. Table 5.7.3-2 also includes samples collected from the base of the four ACF and four W-Pits before they were backfilled. The results are discussed below.

- Arsenic (1.67 to 5.86 mg/kg) exceeded the NMED-approved background concentration of 4.4 mg/kg in only 1 of the 52 samples analyzed.
- Barium (82.8 to 1,110 mg/kg) was detected in 24 of the 58 samples at concentrations above the NMED-approved background of 200 mg/kg.
- Beryllium (0.239 J to 0.579 mg/kg) was not detected in any of the 58 samples at concentrations above the NMED-approved 0.80 mg/kg background value.
- Cadmium (ND to 5.14 mg/kg) was detected in 2 of the 58 samples at concentrations above the 0.9 mg/kg NMED-approved background value.
- Chromium (4.60 to 12.9 mg/kg) exceeded the 12.8 mg/kg NMED-approved background concentration in only 1 of the 58 samples.
- Lead (3.39 to 33.4 mg/kg) exceeded the 11.2 mg/kg NMED-approved background concentration in only 1 of the 58 samples.

- Mercury (ND to 0.369 mg/kg) exceeded the 0.1 mg/kg NMED-approved background concentration in only 2 of the 58 samples.

- Nickel (4.93 to 10.6 mg/kg) was not detected in any of the 58 samples above the 25.4 mg/kg NMED-approved background value.

- Selenium (ND to 0.881 mg/kg) was not detected in any of the 51 samples analyzed above the 0.1 mg/kg NMED-approved background value.

- Silver (ND to 0.223 mg/kg) was not detected in any of the 51 samples analyzed above the 0.1 mg/kg NMED-approved background value.

- Uranium (0.544 to 1.66 mg/kg) was not detected in any of the 50 samples analyzed above the 2.3 mg/kg NMED-approved background value.

Table 5.6.3-7 presents the RPD results for the RCRA metals plus beryllium, nickel, and uranium analyses performed for the eight duplicate soil samples collected from excavation floor and sidewalls. RPDs were only calculated for detections and were not calculated for results that were qualified "J" during data validation. As a result, RPDs were not calculated for beryllium, cadmium, selenium, or silver. RPDs ranged from 4.2 to 16.2 for arsenic, 0.2 to 37.3 for barium, 7.9 to 22.2 for chromium, 1.0 to 13.7 for lead, 2.7 to 140.2 for mercury, 8.2 to 20.0 for nickel, and 5.2 to 41.4 for uranium. Variations in the RPD most likely reflect soil heterogeneity.

Radionuclides

Table 5.7.3-3 presents the results for the gamma spectroscopic analysis of soil samples collected from the VCM excavation floor and sidewalls in August 2000. The table also includes samples collected from the bases of the ACF and W-Pits before they were backfilled. The MDAs for the analyses are presented in Table 5.6.3-9. The results for the 58 samples are discussed below.

- Cesium-137 was not detected in any sample at an activity above the 0.084 pCi/g NMED-approved background value.

- Thorium-232 (ND to 1.12 pCi/g) was not detected in any sample at an activity above the 1.54 pCi/g NMED-approved background value.

- Uranium-235 (ND to 0.254 pCi/g) was only detected in two samples above the 0.18 pCi/g NMED-approved background value.

- Uranium-238 (ND to 0.972 pCi/g) was not detected in any sample at an activity above the 1.3 pCi/g NMED-approved background value.

Tritium

Table 5.7.3-4 presents the analytical results for the tritium analysis of soil samples collected from the excavation floor and sidewalls in August 2000. Table 5.7.3-4 also includes samples collected from the bases of the ACF and W-Pits. Tritium (ND [<99.1 pCi/L] to 923,000 pCi/L)

Table 5.7.3-1
Summary of SWMU 2 Excavation Confirmatory Soil Sampling VOC Analytical Results
March 1998–August 1999
(On-site Laboratory, except where noted)

Sample Attributes			Analyte (EPA Method 8260/8260[a]) (µg/kg)						
Record Number[b]	ER Sample ID[c]	Sample Depth (ft)	Acetone	Ethyl benzene	2-Hexanone	Methylene chloride	Toluene	o-Xylene	p-Xylene, m-Xylene
600005	TA2-2-ACF1-0001-18-S	18	ND (5 J)	ND (2 J)	ND (5)	ND (1)	ND (1)	ND (2)	ND (3)
600004	TA2-2-ACF1-0001-18-S (off-site laboratory split)	18	ND (2 J) H	ND (1 J) H	ND (2 J) H	ND (2.8 J) H	ND (1 J) H	NA	NA
600008	TA2-2-ACF2-0001-15-S	15	ND (5 J)	ND (2 J)	ND (5)	ND (1)	ND (1)	ND (2)	ND (3)
600007	TA2-2-ACF2-0001-15-S (off-site laboratory split)	15	**19**	ND (1)	ND (2)	**2.9 J (5)**	ND (1)	NA	NA
600012	TA2-2-ACF3-0001-12-S	12	ND (6.2)	ND (2.5 J)	ND (6.2)	ND (1.2)	ND (1.2)	ND (2.5 J)	ND (3.8 J)
600010	TA2-2-ACF3-0001-12-S (off-site laboratory split)	12	ND (2)	ND (1)	ND (2)	ND (1)	**1 J (2)**	NA	NA
600041	TA2-2-ACF4-0001-12-S (off-site laboratory split)	12	ND (2)	ND (1)	ND (2)	ND (1)	ND (1)	NA	NA
600046	TA2-2-PTW1-0001-10-S	10	ND (6.7 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600047	TA2-2-PTW1-0001-10-S (off-site laboratory split)	10	**9.1 J (10)**	ND (1)	ND (2)	**2.5 J (5)**	ND (1)	NA	NA
600064	TA2-2-PTW2-0001-12-S	12	**10 J (21)**	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600062	TA2-2-PTW2-0001-12-S (off-site laboratory split)	12	ND (6.7 J)	ND (1 J)	ND (2 J)	R	ND (1 J)	NA	NA
600067	TA2-2-PTW3-0001-12-S (off-site laboratory split)	12	**4.1 J (10)**	ND (1 J)	ND (2 J)	R	ND (1 J)	NA	NA
600066	TA2-2-PTW3-0001-12-S	12	ND (5.2 J)	ND (2.1)	ND (5.2)	ND (1)	ND (1)	ND (2.1)	ND (3.1)
600074	TA2-2-PTW4-0001-15-S	15	R	R	R	R	R	R	R
600072	TA2-2-PTW4-0001-15-S (off-site laboratory split)	15	ND (2.4 J)	ND (0.23)	ND (4.4)	R	ND (0.22)	NA	NA
Quality Assurance/Quality Control Samples[d] (µg/L)									
600007	TA2-2-ACF2-0001-15-S (EB)	NA	ND (2 J) H	ND (1 J) H	ND (2 J) H	ND (1 J) H	ND (1 J) H	NA	NA
600010	TA2-2-ACF3-0001-12-S (EB)	NA	ND (2)	ND (1)	ND (2)	ND (1)	ND (1)	NA	NA
600041	TA2-2-ACF4-TB	NA	R	R	R	R	R	NA	NA
600047	TA2-2-PTW1-TB	NA	R	R	R	R	R	NA	NA
600059	TA2-2-PTW1-EB	NA	ND (2)	ND (1)	ND (2)	**2.4 J (5)**	ND (1)	NA	NA
600059	TA2-2-PTW1-TB	NA	ND (2)	ND (1)	ND (2)	**3.1 J (5)**	ND (1)	NA	NA
600062	TA2-2-PTW2-TB	NA	ND (2 J) H	ND (1 J) H	ND (2 J) H	ND (1.9 J) H	ND (1 J) H	NA	NA
600067	TA2-2-PTW3-TB	NA	ND (2) H	ND (1) H	**22 H**	**3.7 J (5) H**	**1.5 J (2) H**	NA	NA
600072	TA2-2-PTW4-TB	NA	ND (2.2)	ND (0.23)	ND (4.4)	ND (2.2 J)	ND (0.22)	NA	NA

Note: Values in **bold** represent detected VOCs.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample naming scheme is provided in Table 5.6.2-1.
[d]All quality assurance/quality control samples were analyzed by an off-site laboratory.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
H = The holding time was exceeded for the associated sample analysis.
ID = Identification.
J = Analytical result was qualified as an estimated value during data validation.
J ( ) = The reported value is greater than or equal to the method detection limit but is less than the practical quantitation limit, shown in parentheses.
µg/kg = Microgram(s) per kilogram.
µg/L = Microgram(s) per liter.
NA = Not analyzed.
ND = Not detected above the method detection limit, shown in parentheses.
R = Rejected value. See Data Validation report.
SWMU = Solid Waste Management Unit.
VOC = Volatile organic compound.

Table 5.7.3-2
Summary of SWMU 2 Excavation Confirmatory Soil Sampling
RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Depth[d] (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
600004	TA-2-ACF1-0001-18-S	18–18.5	NA	102	0.277 J	ND (0.0104)	7.19	2.28
600007	TA-2-ACF2-0001-15-S	15–15.5	NA	137	0.264 J	0.218 J	6.89	3.75
600010	TA-2-ACF3-0001-12-S	12–12.5	NA	115	0.0509 J	ND (0.0104)	4.18	3.86
600041	TA-2-ACF4-0001-12-S	12–12.5	NA	121	0.126 J	**2.1**	9.98	4.27
600047	TA-2-PTW1-0001-10-S	10–10.5	NA	**262**	0.308 J	0.0978 J	5.13	3.22
600062	TA-2-PTW2-0001-12-S	12–12.5	NA	**479**	0.336 J	**5.14**	6.98	4.09
600067	TA-2-PTW3-0001-12-S	12–12.5	3.12	**264**	0.276 J	0.0553 J	5.4	3.23
600072	TA-2-PTW4-0001-15-S	15–15.5	3.83	170 J	0.258 J	0.143 J	7.71	6.26
603352	TA2-2-FINAL-FLR-400N-3800E-0.5	0.5–1.0	3.07	**223 J**	0.266 J (0.500)	0.264 J (0.500)	4.75 J	3.57
603352	TA2-2-FINAL-FLR-400N-3850E-0.5	0.5–1.0	2.79	**298 J**	0.320 J (0.498)	0.134 J (0.498)	4.60 J	3.58
603352	TA2-2-FINAL-FLR-400N-3900E-0.5	0.5–1.0	3.06	**264 J**	0.323 J (0.500)	0.119 J (0.500)	5.35 J	3.49
603352	TA2-2-FINAL-FLR-400N-3900E-D	0.5–1.0	3.39	**347 J**	0.304 J (0.500)	0.0912 J (0.500)	5.69 J	3.82
603352	TA2-2-FINAL-FLR-400N-3950E-0.5	0.5–1.0	3.28	**201 J**	0.285 J (0.500)	0.176 J (0.500)	5.37 J	3.77
603352	TA2-2-FINAL-FLR-400N-4000E-0.5	0.5–1.0	3.29	108 J	0.318 J (0.500)	0.118 J (0.500)	6.11 J	4.03
603352	TA2-2-FINAL-FLR-400N-4050E-0.5	0.5–1.0	2.51	197 J	0.331 J (0.498)	0.275 J (0.498)	6.07 J	4.82
603352	TA2-2-FINAL-FLR-450N-3800E-0.5	0.5–1.0	2.04	86.1 J	0.336 J (0.498)	0.158 J (0.498)	5.43 J	4.07
603352	TA2-2-FINAL-FLR-450N-3850E-0.5	0.5–1.0	1.67	85.9 J	0.275 J (0.499)	0.168 J (0.499)	4.64 J	3.39
603352	TA2-2-FINAL-FLR-450N-3900E-0.5	0.5–1.0	3.25	**283 J**	0.344 J (0.499)	0.16 J (0.499)	6.37 J	4.77
603352	TA2-2-FINAL-FLR-450N-3950E-0.5	0.5–1.0	2.11	198 J	0.311 J (0.500)	0.135 J (0.500)	5.88 J	4.12
603352	TA2-2-FINAL-FLR-450N-4000E-0.5	0.5–1.0	2.59	**237 J**	0.296 J (0.499)	0.182 J (0.499)	6.54 J	4.49
603352	TA2-2-FINAL-FLR-450N-4000E-D	0.5–1.0	2.34	155 J	0.316 J (0.500)	0.202 J (0.500)	6.09 J	3.92
603354	TA2-2-FINAL-FLR-450N-4050E-0.5	0.5–1.0	3.25	**355**	0.307 J (0.499)	0.223 J (0.499)	**12.9**	4.22
603354	TA2-2-FINAL-FLR-450N-4100E-0.5	0.5–1.0	2.26	135	0.327 J (0.497)	0.484 J (0.497)	6.29	4.58
603354	TA2-2-FINAL-FLR-500N-3800E-0.5	0.5–1.0	2.29	88.6	0.346 J (0.500)	0.140 J (0.500)	6.86	4.94
603356	TA2-2-FINAL-FLR-500N-3850E-0.5	0.5–1.0	1.80	82.8	0.334 J (0.497)	ND (0.0382)	5.54	4.50
603356	TA2-2-FINAL-FLR-500N-3850E-D	0.5–1.0	1.90	83.0	0.404 J (0.500)	ND (0.0382)	6.92	5.15
603356	TA2-2-FINAL-FLR-500N-3900E-0.5	0.5–1.0	2.64	123	0.373 J (0.500)	0.359 J (0.500)	8.26	**33.4**
603356	TA2-2-FINAL-FLR-500N-3950E-0.5	0.5–1.0	3.73	114	0.579	0.217 J (0.499)	10.1	7.26
603356	TA2-2-FINAL-FLR-500N-4000E-0.5	0.5–1.0	2.59	128	0.372 J (0.497)	0.098 J (0.497)	7.36	5.25
603356	TA2-2-FINAL-FLR-500N-4050E-0.5	0.5–1.0	2.32	**217**	0.360 J (0.498)	0.335 J (0.498)	5.97	4.88
603356	TA2-2-FINAL-FLR-500N-4100E-0.5	0.5–1.0	2.44	159	0.347 J (0.498)	0.133 J (0.498)	7.10	5.14
603356	TA2-2-FINAL-FLR-500N-4100E-D	0.5–1.0	2.34	109	0.400 J (0.497)	0.124 J (0.497)	8.32	5.65

R[illegible] footnotes at end of table.

Table 5.7.3-2 (Continued)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling
RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)					
Record Number[b]	ER Sample ID[c]	Sample Depth[d] (ft)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Lead
603356	TA2-2-FINAL-SDW-550N-3770E-1.0	1.0–1.5	2.24	184	0.239 J (0.500)	0.106 J (0.500)	4.85	3.44
603356	TA2-2-FINAL-SDW-550N-3800E-1.0	1.0–1.5	4.27	**219**	0.392 J (0.499)	0.138 J (0.499)	7.99	6.02
603356	TA2-2-FINAL-SDW-550N-3850E-1.0	1.0–1.5	3.77	**440**	0.369 J (0.497)	0.129 J (0.497)	7.10	4.97
603356	TA2-2-FINAL-SDW-550N-3900E-1.0	1.0–1.5	3.13	**328**	0.304 J (0.500)	0.131 J (0.500)	7.55	4.05
603356	TA2-2-FINAL-SDW-550N-3950E-1.0	1.0–1.5	3.62	**301**	0.391 J (0.497)	0.153 J (0.497)	6.63	5.01
603356	TA2-2-FINAL-SDW-550N-3950E-D	1.0–1.5	4.11	**310**	0.382 J (0.498)	0.151 J (0.498)	7.40	4.96
603356	TA2-2-FINAL-SDW-550N-4000E-1.0	1.0–1.5	4.00	**241**	0.399 J (0.498)	0.153 J (0.498)	7.44	5.50
603356	TA2-2-FINAL-SDW-550N-4050E-1.0	1.0–1.5	3.43	**386**	0.470 J (0.500)	ND (0.0382)	9.62	6.19
603356	TA2-2-FINAL-SDW-550N-4100E-1.0	1.0–1.5	3.21	**1110**	0.324 J (0.500)	0.315 J (0.500)	6.40	4.64
603358	TA2-2-FINAL-SDW-365N-3850E-1.0	1.0–1.5	2.35	119	0.280 J (0.481)	ND (0.0382)	6.66	5.87
603358	TA2-2-FINAL-SDW-365N-3900E-1.0	1.0–1.5	2.48	131	0.261 J (0.472)	ND (0.0382)	7.31	5.68
603358	TA2-2-FINAL-SDW-365N-3950E-1.0	1.0–1.5	3.36	157	0.383 J (0.481)	ND (0.0382)	8.62	6.13
603358	TA2-2-FINAL-SDW-370N-4050E-1.0	1.0–1.5	2.91	143	0.304 J (0.463)	0.539	7.04	5.77
603358	TA2-2-FINAL-SDW-375N-4000E-1.0	1.0–1.5	1.99	140	0.256 J (0.500)	ND (0.0382)	6.42	6.61
603358	TA2-2-FINAL-SDW-375N-4000E-D	1.0–1.5	2.34	129	0.241 J (0.481)	ND (0.0382)	6.95	6.69
603358	TA2-2-FINAL-SDW-400N-4100E-1.0	1.0–1.5	2.70	164	0.360 J (0.495)	ND (0.0382)	7.24	5.49
603358	TA2-2-FINAL-SDW-450N-4150E-1.0	1.0–1.5	2.60	110	0.263 J (0.472)	ND (0.0382)	6.18	4.20
603358	TA2-2-FINAL-SDW-450N-4150E-D	1.0–1.5	3.05	131	0.258 J (0.500)	ND (0.0382)	5.41	4.82
603358	TA2-2-FINAL-SDW-500N-4150E-1.0	1.0–1.5	3.24	**257**	0.264 J (0.490)	ND (0.0382)	5.48	4.32
603358	TA2-2-FINAL-SDW-550N-4150E-1.0	1.0–1.5	**5.86**	113	0.260 J (0.476)	ND (0.0382)	5.67	7.21
603360	TA2-2-FINAL-SDW-365N-3800E-1.0	1.0–1.5	3.46	**228**	0.321 J (0.463)	ND (0.0382)	7.13	4.53
603360	TA2-2-FINAL-SDW-375N-3770E-1.0	1.0–1.5	3.34	122	0.352 J (0.476)	ND (0.0382)	7.81	5.40
603360	TA2-2-FINAL-SDW-400N-3770E-1.0	1.0–1.5	3.17	**202**	0.334 J (0.476)	ND (0.0382)	7.42	4.71
603360	TA2-2-FINAL-SDW-450N-3770E-1.0	1.0–1.5	3.21	165	0.344 J (0.485)	ND (0.0382)	6.85	4.10
603360	TA2-2-FINAL-SDW-450N-3770E-D	1.0–1.5	3.73	182	0.326 J (0.463)	ND (0.0382)	6.03	3.85
603360	TA2-2-FINAL-SDW-500N-3770E-1.0	1.0–1.5	3.89	**363**	0.437 J (0.495)	ND (0.0382)	9.42	4.86
Background Soil Concentrations—North Area[e]			4.4	200	0.80	0.9	12.8	11.2
Quality Assurance/Quality Control Samples (mg/L)								
603356	TA2-2-FINL-EB1	8-8-00	ND (0.00257)	0.00212 J	ND (0.00047)	ND (0.00063)	ND (0.00106)	0.00184 J
603356	TA2-2-FINL-EB2	8-8-00	ND (0.00257)	0.00177 J	ND (0.00047)	ND (0.00063)	ND (0.00106)	ND (0.00183)
603356	TA2-2-FINL-EB3	8-8-00	ND (0.00257)	0.00092 J	ND (0.00047)	ND (0.00063)	ND (0.00106)	ND (0.00183)
603360	TA2-2-FINL-EB4	8-9-00	ND (0.00253 J)	0.00299 J	ND (0.00047)	ND (0.00063)	ND (0.00106)	0.00215 J
603360	TA2-2-FINL-EB5	8-9-00	ND (0.00253 J)	0.00085 J	ND (0.00047)	ND (0.00063)	0.0012 J	ND (0.00183)

Refer to footnotes at end of table.

Table 5.7.3-2 (Continued)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling
RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Depth[d] (ft)	Mercury	Nickel	Selenium	Silver	Uranium
600004	TA2-2-ACF1-0001-18-S	18–18.5	ND (0.0173)	0.258 J	NA	NA	NA
600007	TA2-2-ACF2-0001-15-S	15–15.5	ND (0.0173)	4.89	NA	NA	NA
600010	TA2-2-ACF3-0001-12-S	12–12.5	0.0451	4.94	NA	NA	NA
600041	TA2-2-ACF4-0001-12-S	12–12.5	ND (0.0173)	8.78	NA	NA	NA
600047	TA2-2-PTW1-0001-10-S	10–10.5	ND (0.0173)	5.72	NA	NA	NA
600062	TA2-2-PTW2-0001-12-S	12–12.5	0.0233 J	16.8	NA	NA	NA
600067	TA2-2-PTW3-0001-12-S	12–12.5	ND (0.0173)	4.46	NA	NA	NA
600072	TA2-2-PTW4-0001-15-S	15–15.5	ND (0.0173)	8.98	ND (0.07)	ND (0.031)	NA
603352	TA2-2-FINAL-FLR-400N-3800E-0.5	0.5–1.0	0.028	5.03 J	ND (0.146)	ND (0.101)	0.825
603352	TA2-2-FINAL-FLR-400N-3850E-0.5	0.5–1.0	0.0237	5.57 J	ND (0.146)	ND (0.101)	0.853
603352	TA2-2-FINAL-FLR-400N-3900E-0.5	0.5–1.0	0.0149	5.25 J	ND (0.146)	ND (0.101)	0.909
603352	TA2-2-FINAL-FLR-400N-3900E-D	0.5–1.0	0.0159	5.37 J	ND (0.146)	ND (0.101)	0.673
603352	TA2-2-FINAL-FLR-400N-3950E-0.5	0.5–1.0	0.116	5.23 J	ND (0.146)	ND (0.101)	0.749
603352	TA2-2-FINAL-FLR-400N-4000E-0.5	0.5–1.0	0.00794 J (0.009)	5.49 J	ND (0.146)	ND (0.101)	0.790
603352	TA2-2-FINAL-FLR-400N-4050E-0.5	0.5–1.0	0.0797	6.63 J	ND (0.146)	ND (0.101)	1.24
603352	TA2-2-FINAL-FLR-450N-3800E-0.5	0.5–1.0	0.00826 J (0.00972)	6.64 J	ND (0.146)	ND (0.101)	1.37
603352	TA2-2-FINAL-FLR-450N-3850E-0.5	0.5–1.0	0.0177	6.04 J	ND (0.146)	ND (0.101)	0.872
603352	TA2-2-FINAL-FLR-450N-3900E-0.5	0.5–1.0	0.00536 J (0.00912)	6.49 J	ND (0.146)	ND (0.101)	1.57
603352	TA2-2-FINAL-FLR-450N-3950E-0.5	0.5–1.0	0.00509 J (0.00871)	6.58 J	ND (0.146)	ND (0.101)	0.891
603352	TA2-2-FINAL-FLR-450N-4000E-0.5	0.5–1.0	0.011	6.03 J	ND (0.146)	ND (0.101)	0.880
603352	TA2-2-FINAL-FLR-450N-4000E-D	0.5–1.0	0.0113	5.89 J	ND (0.146)	ND (0.101)	1.34
603354	TA2-2-FINAL-FLR-450N-4050E-0.5	0.5–1.0	0.0887	6.08	0.881	ND (0.101)	0.800
603354	TA2-2-FINAL-FLR-450N-4100E-0.5	0.5–1.0	0.0288	5.85	0.828	ND (0.101)	1.27
603354	TA2-2-FINAL-FLR-500N-3800E-0.5	0.5–1.0	0.0134	6.61	ND (0.146)	ND (0.101)	0.733
603356	TA2-2-FINAL-FLR-500N-3850E-0.5	0.5–1.0	0.0151	6.04	ND (0.146)	ND (0.101)	1.40
603356	TA2-2-FINAL-FLR-500N-3850E-D	0.5–1.0	0.0175	7.38	ND (0.146)	ND (0.101)	1.10
603356	TA2-2-FINAL-FLR-500N-3900E-0.5	0.5–1.0	0.0215	8.21	ND (0.146)	ND (0.101)	0.788
603356	TA2-2-FINAL-FLR-500N-3950E-0.5	0.5–1.0	0.0421	10.6	ND (0.146)	ND (0.101)	0.866
603356	TA2-2-FINAL-FLR-500N-4000E-0.5	0.5–1.0	0.012	7.32	ND (0.146)	ND (0.101)	0.697
603356	TA2-2-FINAL-FLR-500N-4050E-0.5	0.5–1.0	0.0932	6.02	ND (0.146)	ND (0.101)	0.721
603356	TA2-2-FINAL-FLR-500N-4100E-0.5	0.5–1.0	0.0231	7.16	ND (0.146)	ND (0.101)	0.877

Refer to footnotes at end of table.

Table 5.7.3-2 (Continued)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling
RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Depth[d] (ft)	Mercury	Nickel	Selenium	Silver	Uranium
603356	TA2-2-FINAL-FLR-500N-4100E-D	0.5–1.0	0.0309	7.87	ND (0.146)	ND (0.101)	0.813
603356	TA2-2-FINAL-SDW-550N-3770E-1.0	1.0–1.5	0.0156	4.97	ND (0.146)	ND (0.101)	1.24
603356	TA2-2-FINAL-SDW-550N-3800E-1.0	1.0–1.5	0.00922 J (0.00923)	8.40	ND (0.146)	ND (0.101)	0.784
603356	TA2-2-FINAL-SDW-550N-3850E-1.0	1.0–1.5	0.00649 J (0.00866)	7.40	0.456 J (0.497)	ND (0.101)	0.645
603356	TA2-2-FINAL-SDW-550N-3900E-1.0	1.0–1.5	0.00718 J (0.00955)	7.57	ND (0.146)	ND (0.101)	0.544
603356	TA2-2-FINAL-SDW-550N-3950E-1.0	1.0–1.5	0.010	6.92	ND (0.146)	ND (0.101)	0.910
603356	TA2-2-FINAL-SDW-550N-3950E-D	1.0–1.5	0.0122	7.51	ND (0.146)	ND (0.101)	0.696
603356	TA2-2-FINAL-SDW-550N-4000E-1.0	1.0–1.5	ND (0.00455)	8.03	ND (0.146)	ND (0.101)	0.770
603356	TA2-2-FINAL-SDW-550N-4050E-1.0	1.0–1.5	0.0253	9.42	ND (0.146)	ND (0.101)	1.13
603356	TA2-2-FINAL-SDW-550N-4100E-1.0	1.0–1.5	0.0579	6.60	ND (0.146)	ND (0.101)	0.756
603358	TA2-2-FINAL-SDW-365N-3850E-1.0	1.0–1.5	0.0315	6.63	0.298 J (0.481)	0.223 J (0.481)	1.22
603358	TA2-2-FINAL-SDW-365N-3900E-1.0	1.0–1.5	0.0109	6.80	ND (0.146)	ND (0.101)	1.47
603358	TA2-2-FINAL-SDW-365N-3950E-1.0	1.0–1.5	0.00861 J (0.00987)	7.67	ND (0.146)	0.209 J (0.481)	1.66
603358	TA2-2-FINAL-SDW-370N-4050E-1.0	1.0–1.5	**0.369**	6.47	0.298 J (0.463)	0.205 J (0.463)	1.43
603358	TA2-2-FINAL-SDW-375N-4000E-1.0	1.0–1.5	0.0631	6.84	0.381 J (0.500)	0.220 J (0.500)	1.30
603358	TA2-2-FINAL-SDW-375N-4000E-D	1.0–1.5	0.0111	5.82	ND (0.146)	ND (0.101)	1.37
603358	TA2-2-FINAL-SDW-400N-4100E-1.0	1.0–1.5	0.0319	7.60	ND (0.146)	0.202 J (0.495)	0.995
603358	TA2-2-FINAL-SDW-450N-4150E-1.0	1.0–1.5	0.0736	5.60	0.469 J (0.472)	ND (0.101)	1.40
603358	TA2-2-FINAL-SDW-450N-4150E-D	1.0–1.5	0.0612	5.16	0.437 J (0.500)	ND (0.101)	1.18
603358	TA2-2-FINAL-SDW-500N-4150E-1.0	1.0–1.5	ND (0.00455)	4.93	0.332 J (0.490)	ND (0.101)	0.864
603358	TA2-2-FINAL-SDW-550N-4150E-1.0	1.0–1.5	0.0381	6.02	ND (0.146)	0.199 J (0.476)	0.977
603360	TA2-2-FINAL-SDW-365N-3800E-1.0	1.0–1.5	0.0138	6.95	0.318 J (0.463)	ND (0.101)	1.14
603360	TA2-2-FINAL-SDW-375N-3770E-1.0	1.0–1.5	0.00979	8.06	0.769 J	ND (0.101)	1.37
603360	TA2-2-FINAL-SDW-400N-3770E-1.0	1.0–1.5	0.0724	6.63	0.598 J	ND (0.101)	0.889
603360	TA2-2-FINAL-SDW-450N-3770E-1.0	1.0–1.5	0.0682	6.22	0.297 J (0.485)	ND (0.101)	0.799
603360	TA2-2-FINAL-SDW-450N-3770E-D	1.0–1.5	0.0407	5.28	ND (0.146 J)	ND (0.101)	1.03
603360	TA2-2-FINAL-SDW-500N-3770E-1.0	1.0–1.5	**0.169**	8.36	0.546 J	ND (0.101)	0.946
Background Soil Concentrations—North Area[e]			<0.1	25.4	<1	<1	2.3
Quality Assurance/Quality Control Samples (mg/L)							
603356	TA2-2-FINL-EB1	8-8-00	R	ND (0.00309)	ND (0.00236)	ND (0.00053)	ND (0.00002)
603356	TA2-2-FINL-EB2	8-8-00	R	ND (0.00309)	ND (0.00236)	ND (0.00053)	ND (0.00002)

Refer to footnotes at end of table.

Table 5.7.3-2 (Concluded)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling
RCRA Metals Plus Beryllium, Nickel, and Uranium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes			Metals (EPA Method SW846 6010/SW846 6020/SW846 7471[a]) (mg/kg)				
Record Number[b]	ER Sample ID[c]	Sample Date	Mercury	Nickel	Selenium	Silver	Uranium
603356	TA2-2-FINL-EB3	8-8-00	R	ND (0.00309)	ND (0.00236)	ND (0.00053)	ND (0.00002)
603360	TA2-2-FINL-EB4	8-9-00	ND (0.00006)	ND (0.00309)	ND (0.00236)	0.0008 J	0.00002 J
603360	TA2-2-FINL-EB5	8-9-00	ND (0.00006)	ND (0.00309)	0.00295 J	ND (0.00053)	ND (0.00002)

Note: Values in **bold** exceed background soil concentrations.
[a]EPA November 1986.
[b]Analysis request/chain-of-custody record.
[c]Sample naming scheme is provided in Table 5.6.2-1.
[d]Depth below final excavation floor or sidewall surface for FINAL and FLOOR samples and below ground for ACF and PTW samples.
[e]From Dinwiddie September 1997. Subsurface values are used for comparison, since these samples were collected 15 to 18 feet below the surface.

EPA = U.S. Environmental Protection Agency.
ER = Environmental Restoration.
ft = Foot (feet).
ID = Identification.
J = Estimated value. See Data Validation report.
J ( ) = The reported value is greater than or equal to the method detection limit but is less than the practical quantification limit, shown in parentheses.
mg/kg = Milligram(s) per kilogram.
mg/L = Milligrams(s) per liter.
NA = Not analyzed or not applicable.
ND ( ) = Not detected above the method detection limit, shown in parentheses.
R = Rejected value. See Data Validation report.
RCRA = Resource Conservation and Recovery Act.
SWMU = Solid Waste Management Unit.

Table 5.7.3-3
Summary of SWMU 2 Excavation Confirmatory Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–August 2000
(On-site Laboratory)

Sample Attributes				Activity (pCi/g)							
				Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Depth (ft)	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
600006	TA2-2-ACF1-0001-18-S	18–18.5	3-06-98	ND (0.0281)	--	0.799	0.375	ND (0.218)	--	ND (2.98)	--
600009	TA2-2-ACF2-0001-15-S	15–15.5	3-12-98	ND (0.0265)	--	0.798	0.375	ND (0.178)	--	0.972	0.763
600011	TA2-2-ACF3-0001-12-S	12–12.5	3-20-98	ND (0.0351)	--	0.703	0.404	ND (0.189)	--	ND (1.25)	--
600042	TA2-2-ACF4-0001-12-S	12–12.5	3-25-98	ND (0.028)	--	0.721	0.357	ND (0.181)	--	ND (1.59)	--
600045	TA2-2-PTW1-0001-10-S	10–10.5	4-01-98	ND (0.0295)	--	0.529	0.312	ND (0.165)	--	0.375	0.649
600063	TA2-2-PTW2-0001-12-S	12–12.5	4-09-98	ND (0.0272)	--	0.581	0.334	ND (0.179)	--	ND (1.53)	--
600065	TA2-2-PTW3-0001-12-S	12–12.5	4-13-98	ND (0.0328)	--	0.56	0.362	ND (0.176)	--	0.715	0.626
600073	TA2-2-PTW4-0001-15-S	15–15.5	4-20-98	ND (0.0319)	--	0.696	0.426	ND (0.186)	--	0.821	0.626
603351	TA2-2-FINAL-FLR-400N-3800E-0.5	0.5–1.0	8-07-00	ND (0.0263)	--	ND (0.122)	--	0.14	0.151	ND (0.68)	--
603351	TA2-2-FINAL-FLR-400N-3850E-0.5	0.5–1.0	8-07-00	ND (0.0244)	--	0.496	0.299	0.14	0.147	ND (0.626)	--
603351	TA2-2-FINAL-FLR-400N-3900E-0.5	0.5–1.0	8-07-00	ND (0.0281)	--	0.721	0.401	ND (0.202)	--	ND (0.686)	--
603351	TA2-2-FINAL-FLR-400N-3900E-D	0.5–1.0	8-07-00	ND (0.0252)	--	0.595	0.324	ND (0.181)	--	ND (0.61)	--
603351	TA2-2-FINAL-FLR-400N-3950E-0.5	0.5–1.0	8-07-00	ND (0.0258)	--	0.603	0.331	ND (0.19)	--	ND (0.643)	--
603351	TA2-2-FINAL-FLR-400N-4000E-0.5	0.5–1.0	8-07-00	ND (0.026)	--	0.737	0.678	0.154	0.154	ND (0.682)	--
603351	TA2-2-FINAL-FLR-400N-4050E-0.5	0.5–1.0	8-07-00	ND (0.0273)	--	0.966	0.474	ND (0.206)	--	ND (0.707)	--
603351	TA2-2-FINAL-FLR-450N-3800E-0.5	0.5–1.0	8-07-00	ND (0.0358)	--	1.12	0.577	ND (0.16)	--	ND (0.565)	--
603351	TA2-2-FINAL-FLR-450N-3850E-0.5	0.5–1.0	8-07-00	ND (0.032)	--	0.793	1.5	ND (0.193)	--	0.503	0.51
603351	TA2-2-FINAL-FLR-450N-3900E-0.5	0.5–1.0	8-07-00	ND (0.0361)	--	0.922	0.51	0.127	0.171	ND (0.523)	--
603351	TA2-2-FINAL-FLR-450N-3950E-0.5	0.5–1.0	8-07-00	ND (0.0321)	--	0.726	0.389	0.171	0.161	ND (0.511)	--
603351	TA2-2-FINAL-FLR-450N-4000E-0.5	0.5–1.0	8-07-00	ND (0.0331)	--	0.798	0.434	0.0945	0.17	ND (0.511)	--
603351	TA2-2-FINAL-FLR-450N-4000E-D	0.5–1.0	8-07-00	ND (0.0332)	--	0.855	0.459	ND (0.185)	--	ND (0.505)	--
603353	TA2-2-FINAL-FLR-450N-4050E-0.5	0.5–1.0	8-07-00	ND (0.0336)	--	0.853	0.456	ND (0.188)	--	ND (0.503)	--
603353	TA2-2-FINAL-FLR-450N-4100E-0.5	0.5–1.0	8-07-00	ND (0.034)	--	0.976	0.487	**0.254**	0.172	ND (0.553)	--
603353	TA2-2-FINAL-FLR-500N-3800E-0.5	0.5–1.0	8-07-00	ND (0.0448)	--	0.866	0.496	ND (0.233)	--	ND (0.643)	--
603355	TA2-2-FINAL-FLR-500N-3850E-0.5	0.5–1.0	8-08-00	ND (0.0361)	--	0.701	1.05	0.114	0.168	ND (0.53)	--
603355	TA2-2-FINAL-FLR-500N-3850E-D	0.5–1.0	8-08-00	ND (0.0376)	--	0.684	1.27	0.129	0.176	ND (0.509)	--
603355	TA2-2-FINAL-FLR-500N-3900E-0.5	0.5–1.0	8-08-00	ND (0.0364)	--	ND (0.14)	--	ND (0.192)	--	0.505	0.434
603355	TA2-2-FINAL-FLR-500N-3950E-0.5	0.5–1.0	8-08-00	ND (0.0396)	--	ND (0.167)	--	**0.228**	0.184	0.705	0.647
603355	TA2-2-FINAL-FLR-500N-4000E-0.5	0.5–1.0	8-08-00	ND (0.0397)	--	0.895	0.625	ND (0.215)	--	ND (0.588)	--
603355	TA2-2-FINAL-FLR-500N-4050E-0.5	0.5–1.0	8-08-00	ND (0.0414)	--	0.792	1.18	0.106	0.182	ND (0.591)	--
603355	TA2-2-FINAL-FLR-500N-4100E-0.5	0.5–1.0	8-08-00	ND (0.0357)	--	0.786	0.446	0.0973	0.174	0.544	0.487

Refer to footnotes at end of table.

Table 5.7.3-3 (Continued)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–August 2000
(On-site Laboratory)

Sample Attributes				Activity (pCi/g)							
				Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Depth (ft)	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
603355	TA2-2-FINAL-FLR-500N-4100E-D	0.5–1.0	8-08-00	ND (0.0285)	--	0.936	0.438	ND (0.211)	--	ND (0.72)	--
603355	TA2-2-FINAL-SDW-550N-3770E-1.0	1.0–1.5	8-08-00	ND (0.0268)	--	0.593	0.29	ND (0.197)	--	ND (0.684)	--
603355	TA2-2-FINAL-SDW-550N-3800E-1.0	1.0–1.5	8-08-00	ND (0.0281)	--	0.665	0.316	ND (0.21)	--	ND (0.732)	--
603355	TA2-2-FINAL-SDW-550N-3850E-1.0	1.0–1.5	8-08-00	ND (0.0283)	--	0.638	0.362	0.166	0.163	ND (0.713)	--
603355	TA2-2-FINAL-SDW-550N-3900E-1.0	1.0–1.5	8-08-00	ND (0.0235)	--	ND (0.105)	--	ND (0.177)	--	ND (0.621)	--
603355	TA2-2-FINAL-SDW-550N-3950E-1.0	1.0–1.5	8-08-00	ND (0.0296)	--	0.682	0.324	0.103	0.167	ND (0.747)	--
603355	TA2-2-FINAL-SDW-550N-3950E-D	1.0–1.5	8-08-00	ND (0.0259)	--	0.69	0.381	ND (0.201)	--	ND (0.704)	--
603355	TA2-2-FINAL-SDW-550N-4000E-1.0	1.0–1.5	8-08-00	ND (0.0285)	--	0.701	0.374	ND (0.215)	--	ND (0.757)	--
603355	TA2-2-FINAL-SDW-550N-4050E-1.0	1.0–1.5	8-08-00	ND (0.0285)	--	0.835	1.5	ND (0.217)	--	ND (0.756)	--
603355	TA2-2-FINAL-SDW-550N-4100E-1.0	1.0–1.5	8-08-00	ND (0.0282)	--	0.743	0.362	0.0981	0.103	ND (0.708)	--
603357	TA2-2-FINAL-SDW-365N-3850E-1.0	1.0–1.5	8-08-00	ND (0.0251)	--	0.737	0.392	ND (0.187)	--	ND (0.62)	--
603357	TA2-2-FINAL-SDW-365N-3900E-1.0	1.0–1.5	8-08-00	ND (0.0265)	--	0.878	0.453	ND (0.19)	--	ND (0.651)	--
603357	TA2-2-FINAL-SDW-365N-3950E-1.0	1.0–1.5	8-08-00	ND (0.0282)	--	0.757	0.41	ND (0.204)	--	ND (0.7)	--
603357	TA2-2-FINAL-SDW-370N-4050E-1.0	1.0–1.5	8-08-00	ND (0.0257)	--	0.87	1.14	ND (0.193)	--	ND (0.672)	--
603357	TA2-2-FINAL-SDW-375N-4000E-1.0	1.0–1.5	8-08-00	ND (0.0269)	--	0.685	0.324	ND (0.195)	--	ND (0.657)	--
603357	TA2-2-FINAL-SDW-375N-4000E-D	1.0–1.5	8-08-00	ND (0.0251)	--	0.789	0.765	ND (0.191)	--	ND (0.647)	--
603357	TA2-2-FINAL-SDW-400N-4100E-1.0	1.0–1.5	8-08-00	ND (0.026)	--	0.722	0.367	ND (0.193)	--	ND (0.679)	--
603357	TA2-2-FINAL-SDW-450N-4150E-1.0	1.0–1.5	8-08-00	ND (0.0253)	--	0.828	0.418	ND (0.191)	--	ND (0.665)	--
603357	TA2-2-FINAL-SDW-450N-4150E-D	1.0–1.5	8-08-00	ND (0.0271)	--	ND (0.115)	--	0.116	0.164	ND (0.707)	--
603357	TA2-2-FINAL-SDW-500N-4150E-1.0	1.0–1.5	8-08-00	ND (0.0247)	--	ND (0.109)	--	ND (0.191)	--	ND (0.652)	--
603357	TA2-2-FINAL-SDW-550N-4150E-1.0	1.0–1.5	8-08-00	ND (0.0262)	--	0.673	0.373	ND (0.189)	--	ND (0.663)	--
603359	TA2-2-FINAL-SDW-365N-3800E-1.0	1.0–1.5	8-09-00	ND (0.0255)	--	0.798	0.374	0.114	0.161	ND (0.702)	--
603359	TA2-2-FINAL-SDW-375N-3770E-1.0	1.0–1.5	8-09-00	ND (0.0262)	--	0.812	0.421	ND (0.196)	--	ND (0.683)	--
603359	TA2-2-FINAL-SDW-400N-3770E-1.0	1.0–1.5	8-09-00	ND (0.0232)	--	0.702	0.325	ND (0.182)	--	ND (0.598)	--
603359	TA2-2-FINAL-SDW-450N-3770E-1.0	1.0–1.5	8-09-00	ND (0.0255)	--	0.501	0.301	ND (0.182)	--	ND (0.612)	--
603359	TA2-2-FINAL-SDW-450N-3770E-D	1.0–1.5	8-09-00	ND (0.0256)	--	0.647	0.304	ND (0.187)	--	ND (0.633)	--

Refer to footnotes at end of table.

Table 5.7.3-3 (Concluded)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling Gamma Spectroscopy Analytical Results
March 1998–August 2000
(On-site Laboratory)

Sample Attributes				Activity (pCi/g)							
				Cesium-137		Thorium-232		Uranium-235		Uranium-238	
Record Number[a]	ER Sample ID[b]	Sample Depth (ft)	Sample Date	Result	Error[c]	Result	Error[c]	Result	Error[c]	Result	Error[c]
603359	TA2-2-FINAL-SDW-500N-3770E-1.0	1.0–1.5	8-09-00	ND (0.0246)	--	0.682	1.16	ND (0.19)	--	ND (0.656)	--
Background Soil Activities—North Area[d]				0.084[e]	--	1.54	--	0.18	--	1.3	--
Quality Control/Quality Assurance Samples (pCi/mL)											
603351	TA2-2-FINAL-EB1	NA	8-07-00	ND (0.0198)	--	ND (0.153)	--	ND (0.132)	--	ND (0.299)	--
603355	TA2-2-FINAL-EB2	NA	8-08-00	ND (0.0169)	--	ND (0.121)	--	ND (0.124)	--	ND (0.317)	--
603355	TA2-2-FINAL-EB3	NA	8-08-00	ND (0.0183)	--	ND (0.138)	--	ND (0.14)	--	ND (0.375)	--
603359	TA2-2-FINAL-EB4	NA	8-09-00	ND (0.017)	--	ND (0.114)	--	ND (0.133)	--	ND (0.358)	--
603359	TA2-2-FINAL-EB5	NA	8-09-00	ND (0.0187)	--	ND (0.114)	--	ND (0.129)	--	ND (0.331)	--

Note: Values in **bold** exceed background soil activities.
[a]Analysis request/chain-of-custody record.
[b]Sample naming scheme is provided in Table 5.6.2-1.
[c]Two standard deviations about the mean detected activity.
[d]From Dinwiddie September 1997.
[e]The more conservative, lower subsurface background activity is used as a benchmark for consistency with current risk screening assessment methodology.
ER = Environmental Restoration.
ID = Identification.
NA = Not applicable.
ND ( ) = Not detected above the minimum detectable activity, shown in parentheses.
pCi/g = Picocurie(s) per gram.
pCi/mL = Picocurie(s) per milliliter.
SWMU = Solid Waste Management Unit.
-- = Error not provided for nondetect results.

Table 5.7.3-4
Summary of SWMU 2 Excavation Confirmatory Soil Sampling Tritium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes				Activity (pCi/L)	
Record Number[a]	ER Sample ID[b]	Sample Depth (ft)	Sample Date	Result	Error[c]
600004	TA2-2-ACF1-0001-18-S	18–18.5	3-06-98	ND (99.1)	--
600007	TA2-2-ACF2-0001-15-S	15–15.5	3-12-98	**1,120**	135
600010	TA2-2-ACF3-0001-12-S	12–12.5	3-20-98	**1,000**	240
600041	TA2-2-ACF4-0001-12-S	12–12.5	3-25-98	**140,000**	745
600047	TA2-2-PTW1-0001-10-S	10–10.5	4-01-98	**482,000**	2,710
600062	TA2-2-PTW2-0001-12-S	12–12.5	4-09-98	**649,000**	1,730
600067	TA2-2-PTW3-0001-12-S	12–12.5	4-13-98	**21,100**	334
600072	TA2-2-PTW4-0001-15-S	15–15.5	4-20-98	**64,600**	1,310
603352	TA2-2-FINAL-FLR-400N-3800E-0.5	0.5–1.0	8-07-00	**15,200**	688
603352	TA2-2-FINAL-FLR-400N-3850E-0.5	0.5–1.0	8-07-00	**21,400**	834
603352	TA2-2-FINAL-FLR-400N-3900E-0.5	0.5–1.0	8-07-00	**742**	200
603352	TA2-2-FINAL-FLR-400N-3900E-D	0.5–1.0	8-07-00	**618**	191
603352	TA2-2-FINAL-FLR-400N-3950E-0.5	0.5–1.0	8-07-00	**46,700**	1,370
603352	TA2-2-FINAL-FLR-400N-4000E-0.5	0.5–1.0	8-07-00	**43,900**	1,310
603352	TA2-2-FINAL-FLR-400N-4050E-0.5	0.5–1.0	8-07-00	**21,200**	838
603352	TA2-2-FINAL-FLR-450N-3800E-0.5	0.5–1.0	8-07-00	**13,400**	649
603352	TA2-2-FINAL-FLR-450N-3850E-0.5	0.5–1.0	8-07-00	**8,720**	516
603352	TA2-2-FINAL-FLR-450N-3900E-0.5	0.5–1.0	8-07-00	**1,230**	232
603352	TA2-2-FINAL-FLR-450N-3950E-0.5	0.5–1.0	8-07-00	**271,000**	5,430
603352	TA2-2-FINAL-FLR-450N-4000E-0.5	0.5–1.0	8-07-00	**17,700**	746
603352	TA2-2-FINAL-FLR-450N-4000E-D	0.5–1.0	8-07-00	**15,200**	694
603354	TA2-2-FINAL-FLR-450N-4050E-0.5	0.5–1.0	8-07-00	**923,000**	24,300
603354	TA2-2-FINAL-FLR-450N-4100E-0.5	0.5–1.0	8-07-00	**905**	217
603354	TA2-2-FINAL-FLR-500N-3800E-0.5	0.5–1.0	8-07-00	**15,000**	571
603356	TA2-2-FINAL-FLR-500N-3850E-0.5	0.5–1.0	8-08-00	**38,500**	1,040
603356	TA2-2-FINAL-FLR-500N-3850E-D	0.5–1.0	8-08-00	**30,500**	885
603356	TA2-2-FINAL-FLR-500N-3900E-0.5	0.5–1.0	8-08-00	**1,490**	232
603356	TA2-2-FINAL-FLR-500N-3950E-0.5	0.5–1.0	8-08-00	**1,780**	242
603356	TA2-2-FINAL-FLR-500N-4000E-0.5	0.5–1.0	8-08-00	**9,860**	453
603356	TA2-2-FINAL-FLR-500N-4050E-0.5	0.5–1.0	8-08-00	**36,200**	993
603356	TA2-2-FINAL-FLR-500N-4100E-0.5	0.5–1.0	8-08-00	**91,500**	2,430
603356	TA2-2-FINAL-FLR-500N-4100E-D	0.5–1.0	8-08-00	**78,100**	2,080
603356	TA2-2-FINAL-SDW-550N-3770E-1.0	1.0–1.5	8-08-00	**1,360**	238
603356	TA2-2-FINAL-SDW-550N-3800E-1.0	1.0–1.5	8-08-00	ND (161)	--
603356	TA2-2-FINAL-SDW-550N-3850E-1.0	1.0–1.5	8-08-00	ND (168)	--
603356	TA2-2-FINAL-SDW-550N-3900E-1.0	1.0–1.5	8-08-00	**788**	211
603356	TA2-2-FINAL-SDW-550N-3950E-1.0	1.0–1.5	8-08-00	356	198
603356	TA2-2-FINAL-SDW-550N-3950E-D	1.0–1.5	8-08-00	311	196
603356	TA2-2-FINAL-SDW-550N-4000E-1.0	1.0–1.5	8-08-00	239	193
603356	TA2-2-FINAL-SDW-550N-4050E-1.0	1.0–1.5	8-08-00	**3,000**	283
603356	TA2-2-FINAL-SDW-550N-4100E-1.0	1.0–1.5	8-08-00	**571**	204
603358	TA2-2-FINAL-SDW-365N-3850E-1.0	1.0–1.5	8-08-00	**1,070**	234

Refer to footnotes at end of table.

Table 5.7.3-4 (Concluded)
Summary of SWMU 2 Excavation Confirmatory Soil Sampling Tritium Analytical Results
March 1998–August 2000
(Off-site Laboratory)

Sample Attributes				Activity (pCi/L)	
Record Number[a]	ER Sample ID[b]	Sample Depth (ft)	Sample Date	Result	Error[c]
603358	TA2-2-FINAL-SDW-365N-3900E-1.0	1.0–1.5	8-08-00	**1,350**	261
603358	TA2-2-FINAL-SDW-365N-3950E-1.0	1.0–1.5	8-08-00	**510**	236
603358	TA2-2-FINAL-SDW-370N-4050E-1.0	1.0–1.5	8-08-00	**827**	325
603358	TA2-2-FINAL-SDW-375N-4000E-1.0	1.0–1.5	8-08-00	**1,150**	244
603358	TA2-2-FINAL-SDW-375N-4000E-D	1.0–1.5	8-08-00	**2,330**	293
603358	TA2-2-FINAL-SDW-400N-4100E-1.0	1.0–1.5	8-08-00	**1,400**	255
603358	TA2-2-FINAL-SDW-450N-4150E-1.0	1.0–1.5	8-08-00	**29,400**	1,070
603358	TA2-2-FINAL-SDW-450N-4150E-D	1.0–1.5	8-08-00	**28,200**	902
603358	TA2-2-FINAL-SDW-500N-4150E-1.0	1.0–1.5	8-08-00	**741**	240
603358	TA2-2-FINAL-SDW-550N-4150E-1.0	1.0–1.5	8-08-00	**3,020**	325
603360	TA2-2-FINAL-SDW-365N-3800E-1.0	1.0–1.5	8-09-00	209	163
603360	TA2-2-FINAL-SDW-375N-3770E-1.0	1.0–1.5	8-09-00	**5,120**	403
603360	TA2-2-FINAL-SDW-400N-3770E-1.0	1.0–1.5	8-09-00	**5,360**	409
603360	TA2-2-FINAL-SDW-450N-3770E-1.0	1.0–1.5	8-09-00	**6,160**	439
603360	TA2-2-FINAL-SDW-450N-3770E-D	1.0–1.5	8-09-00	**5,960**	430
603360	TA2-2-FINAL-SDW-500N-3770E-1.0	1.0–1.5	8-09-00	387	176
Background Soil Activity[d]				420	--
Quality Assurance/Quality Control Samples (pCi/L)					
603356	TA2-2-FINAL-EB1	NA	8-07-00	ND (225)	--
603356	TA2-2-FINAL-EB2	NA	8-08-00	ND (225)	--
603356	TA2-2-FINAL-EB3	NA	8-08-00	ND (227)	--
603360	TA2-2-FINAL-EB4	NA	8-09-00	ND (227 J)	--
603360	TA2-2-FINAL-EB5	NA	8-09-00	ND (229 J)	--

Note: Values in **bold** exceed background soil activity.
[a]Analysis request/chain-of-custody record.
[b]Sample naming scheme given in Table 5.6.2-1.
[c]Two standard deviations about the mean detected activity.
[d]From Tharp February 1999.
D = Soil sample duplicate.
EB = Equipment blank.
ER = Environmental Restoration.
ID = Identification.
J = Estimated value. See Data Validation report.
NA = Not applicable.
ND() = Not detected above the minimum detectable activity shown in parentheses.
pCi/L = Picocurie(s) per liter.
S = Soil sample.
SWMU = Solid Waste Management Unit.
-- = Error not provided for nondetect results.

exceeded the 420 pCi/L SNL/NM-established background (Tharp February 1999) in 50 of the 58 samples analyzed by distillation at the off-site laboratory.

5.7.4 QA/QC Samples and Data Validation Results

QA/QC samples were collected at an approximate frequency of one per 10 field samples. These included duplicates, MS/MSD, equipment blanks, and trip blanks (the latter for VOC analysis only).

All laboratory data for excavated and confirmatory samples were reviewed and verified/validated according to "Data Verification/Validation Level 3-DV," in Attachment C of the Technical Operating Procedure 94-03, Rev. 0 (SNL/NM July 1994) or "Data Validation Procedure for Chemical and Radiochemical Data," in SNL/NM Environmental Restoration Project Administrative Operating Procedure (AOP) 00-03, Rev. 0 (SNL/NM December 1999). In addition, SNL/NM Department 7713 (RPSD Laboratory) reviewed all gamma spectroscopy results according to "Laboratory Data Review Guidelines," Procedure No. RPSD-02-11, Issue No. 2 (SNL/NM July 1996). Annex 5-E contains the data validation reports for the excavated and confirmatory soil samples. The data are acceptable for use in the SWMU 2 NFA proposal.

<u>VOCs</u>

Sixty-seven soil samples had one or more of the VOC analytes qualified "J" for values less than the reporting limit or uncertainties in the detection limit. Two soil samples were rejected, one sample had an acetone value rejected, and one acetone value was qualified for a missed holding time. Three trip blanks were rejected; three more had rejected acetone values and three were qualified for missed holding times.

<u>SVOCs</u>

Only one SVOC was reported. The detection of bis(2-ethylhexyl) phthalate was qualified "J" because the reported value was less than the laboratory reporting limit.

<u>HE</u>

None of the results for HE compounds were qualified.

<u>Metals</u>

No metal results were rejected for the excavated soil samples. Most of the barium, mercury, cadmium, and selenium results were qualified "J" for uncertainties in the laboratory reporting limit. Several arsenic, beryllium, selenium, and silver values were qualified as nondetects ("U") during the data validation process.

None of the confirmatory soil sample results were rejected. Many of the beryllium, cadmium, mercury, selenium, and silver results were qualified "J." Mercury was rejected in three of the five equipment blanks.

Radionuclides

No gamma spectroscopy results were qualified for excavated soil samples. Two tritium results were qualified "J".

No gamma spectroscopy results were qualified for the confirmatory soil samples. For tritium, two of the five equipment-blank nondetects were qualified "J."

5.8 Site Conceptual Model

The site conceptual model for SWMU 2 is based upon the residual COCs identified in the excavated soil and confirmatory soil samples. This section summarizes the nature and extent of contamination and the environmental fate of the COCs.

5.8.1 Nature and Extent of Contamination

As mentioned in Section 5.1, resampling of the excavated soil stockpiles confirmed the presence of low concentrations of PCBs. Additional characterization of the soil and excavation is currently being conducted and the results, including a revised risk assessment, will be presented in an addendum to this NFA proposal. The discussions that follow do not include the results from the latest sampling event.

The potential COCs at SWMU 2 were metals, VOCs, SVOCs, HE compounds, and radionuclides resulting from the disposal of classified materials at the site. Metal and radionuclide COCs were determined by comparing sample results to background concentrations established for the North Area Supergroup (Dinwiddie September 1997). Any metal or radionuclide found to exceed background in any sample was considered to be a potential COC for the site. Metal COCs included the eight RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) plus beryllium, nickel, and uranium (Table 5.8.1-1). The VOCs include 2-hexanone, acetone, ethyl benzene, methylene chloride, toluene, and xylene. The only SVOC was bis(2-ethylhexyl) phthalate. Radionuclides include uranium-235, uranium-238, thorium-232, cesium-137, and tritium.

Table 5.8.1-1 summarizes the distribution and simple statistics for COCs at SWMU 2, including the number of detections exceeding background and where VOCs and SVOCs were detected. Confirmatory samples were collected from the floor of the ACF and W-Pits and from the floor and sidewalls of the final SWMU 2 excavation. Samples were also collected from the excavated soil, which are planned for use as backfill pending the final SWMU 2 risk assessment.

Table 5.8.1-1
Summary of COCs for SWMU 2

COC Type	Number of Samples[a]	COCs Greater than Background	Maximum Background Limit/North Area Super Group[b] (mg/kg except where noted)	Maximum Concentration (mg/kg except where noted)	Average Concentration[c] (mg/kg except where noted)	Sampling Locations Where Background Concentration Exceeded[d]
Metals	356 environmental	Arsenic	4.4	8.3	2.94	TA2-2-TRB3-SL16-000-S TA2-2-2LAY-DOWN-BIN-S TA2-2-3LAY-DOWN-BIN-N TA2-2-BORROW-1 TA2-2-BORROW-2 TA2-2-PTW3-0001-12-S TA2-2-PTW4-0001-15-S TA2-2-FINAL-SDW-550N-4150E-1.0
	368 environmental	Barium	200	8,100	253.21	134 samples
		Beryllium	0.80	4.20	0.44	TA2-2-TRC8-C/F-BIN-S TA2-2-TRD8-C/F-BIN-S TA2-2-3LAY-DOWN-BIN-S TA2-2-3LAY-DOWN-BIN-W TA2-2-8LAY-DOWN-BIN-WDU TA2-2-9LAY-DOWN-BIN-E
		Cadmium	0.9	740	13.13	201 samples
		Chromium	12.8	460	14.80	104 samples
		Lead	11.2	620	20.28	94 samples
		Mercury	<0.1	180	1.94	200 samples
		Nickel	25.4	400	16.16	15 samples
	354 environmental	Selenium	<1	250	1.38	29 samples
	355 environmental	Silver	<1	110	1.52	61 samples
	318 environmental	Uranium	2.3	4.50	1.11	TA2-2-TRA1-SL01-000-S TA2-2-3LAY-DOWN-BIN-E TA2-2-8LAY-DOWN-BIN-W TA2-2-9LAY-DOWN-BIN-E

Refer to footnotes at end of table.

Table 5.8.1-1 (Continued)
Summary of COCs for SWMU 2

COC Type	Number of Samples[a]	COCs Greater than Background	Maximum Background Limit/North Area Super Group[b] (mg/kg except where noted)	Maximum Concentration (mg/kg except where noted)	Average Concentration[c] (mg/kg except where noted)	Sampling Locations Where Background Concentration Exceeded[d]
Volatile Organic Compounds	131 environmental	2-Hexanone	NA	14 J µg/kg	30.2 µg/kg	TA2-2-PW12-0001-SL8-S TA2-2-SLPE-SL16-000-S
		Acetone	NA	19 µg/kg	16.8 µg/kg	TA2-2-ACF2-0001-15-S TA2-2-PTW1-0001-10-S TA2-2-PW12-0001-SL7-S TA2-2-PW12-0001-SL8-S TA2-2-PTW2-0001-12-S TA2-2-PTW3-0001-12-S TA2-2-PTW3-0001-SL4-S TA2-2-SLPE-0001-SL9-S
		Ethyl benzene	NA	4.3 J µg/kg	6.2 µg/kg	TA2-2-ACF2-0001-SL4-S
		Methylene chloride	NA	7.3 µg/kg	3.6 µg/kg	TA2-2-ACF-2-001-15-S TA2-2-PTW1-0001-10-S TA2-2-TRE6-SL09-000-S TA2-2-TR2-EAST-FNCE-002-S TA2-2-TR2-P12A-SL6-DU TA2-2-TR2-P12A-SL6-S
		Toluene	NA	1 J µg/kg	3.2 µg/kg	TA2-2-ACF3-0001-12-S
	122 environmental	o-Xylene	NA	14 µg/kg	7.0 µg/kg	TA2-2-PW12-0001-SL8-S TA2-2-ACF2-0001-SL4-S
		p-, m-Xylenes	NA	21 µg/kg	10.9 µg/kg	TA2-2-PW12-0001-SL8-S TA2-2-ACF2-0001-SL4-S

Refer to footnotes at end of table.

Table 5.8.1-1 (Concluded)
Summary of COCs for SWMU 2

COC Type	Number of Samples[a]	COCs Greater than Background	Maximum Background Limit/North Area Super Group[b] (mg/kg except where noted)	Maximum Concentration (mg/kg except where noted)	Average Concentration[c] (mg/kg except where noted)	Sampling Locations Where Background Concentration Exceeded[d]
Semivolatile Organic Compounds	9 environmental	bis(2-Ethylhexyl) phthalate	NA	207 J µg/kg	179 µg/kg	TA2-2-TRE6-SL09-000-S
Radionuclides	453 environmental	U-235	0.18 pCi/g	3.28 pCi/g	Not calculated[e]	17 samples
		U-238	1.3 pCi/g	208 pCi/g	Not calculated[e]	TA2-2-TRE1-0001-000-S TA2-2-TRE1-SL06-000-S TA2-2-TRE1-SL-13-000-S TA2-2-TRE2-SL07-000-S TA2-2-TRE3-SL07-000-S TA2-2-TRD3-SL03-000-S TA2-2-TRD3-SL06-000-S TA2-2-TRC9-C/F-BIN-S TA2-2-TRB3-SL-16-000-S TA2-2-P191-5C/F-BIN-S
		Th-232	1.54 pCi/g	3.58 pCi/g	Not calculated[e]	TA2-2-TRA2-SL02-000-S
		Cs-137	0.084 pCi/g	0.247 pCi/g	Not calculated[e]	TA2-2-TRC8-SL17-000-S TA2-2-TRC7-C6-BIN-S TA2-2-P298-C/F-BIN-S
	218 environmental	Tritium	420 pCi/L[f]	1,718,000 pCi/L	Not calculated[e]	180 samples
High Explosives	10 environmental	None	NA	NA	NA	None

[a]Number of samples includes duplicates and splits.
[b]From Dinwiddie September 1997.
[c]Average concentration includes all samples. For nondetect results, the method detection limit is used to calculate the average.
[d]Includes samples with nondetect results where the MDA or MDL exceeds the approved background limit; sample naming scheme is provided in Table 5.6.2-1.
[e]An average MDA is not calculated because of the variability in instrument counting error and the number of reported nondetect activities.
[f]From Tharp February 1999.

COC = Constituent of concern.
J = The reported value is greater than or equal to the MDL but is less than the practical quantitation limit.
MDA = Minimum detectable activity.
MDL = Method detection limit.
µg/kg = Microgram(s) per kilogram.
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
pCi/g = Picocurie(s) per gram.
pCi/L = Picocurie(s) per liter.
SWMU = Solid Waste Management Unit.

5.8.2 Environmental Fate

The primary source for COCs was the disposal of classified materials in the landfill. Based upon the nature and extent of contamination at the site (Section 5.8.1), the excavation and excavated soil contains residual metals, VOCs, SVOCs, and radionuclides.

Because the VCM removed the primary contaminant source (weapon components and other material), only secondary sources of COCs remain in the form of residual metals, VOCs, SVOCs, and radionuclides in the subsurface of the excavation and pits and in the excavated soils that will be used as backfill. Since the backfilled excavation will be covered with at least 5 feet (1.5 meters) of imported clean fill, the secondary release mechanisms at SWMU 2 are dissolution of COCs and percolation through the soil, direct contact with soil (radionuclides only), VOC vapor emanations, dust emissions, and uptake of COCs by biota (Figure 5.8.2-1).

The depth to groundwater at the site is approximately 270 feet bgs for the shallow water-bearing zone and 520 feet bgs for the regional aquifer. The vadose zone is comprised of relatively impermeable carbonate-rich soil horizons and impermeable carbonate-cemented (caliche) horizons (SNL/NM March 1995). In addition, high-partitioning coefficients and low mobility in the transporting medium enhance dilution of the COC concentrations. As a result, the nature and extent of COCs as defined in this NFA proposal do not render groundwater a viable contaminant pathway. The pathways to receptors are soil, water, and air. Biota also provides a pathway through food chain transfers. Annex 5-F, Section V, provides additional discussion of the fate and transport of COCs at SWMU 2.

Surface-water is not considered a possible runoff mechanism since SWMU 2 is located well above the Tijeras Arroyo floodplain and over 1,400 feet away from the active channel. The arid climate makes it unlikely that rainfall or runoff could erode the site.

The current land use for SWMU 2 is industrial. The future land use is also industrial (DOE and USAF March 1996); therefore, the potential human receptor at the site is an industrial worker. For all applicable pathways, the exposure route for the industrial worker is dermal contact, external irradiation, and ingestion/inhalation. Ingestion of soil, external irradiation from soil, and ingestion/inhalation of air are considered the major exposure routes for the industrial worker. Because of the clean soil layer planned for the backfilled excavation, wildlife is considered the only potential ecological receptor at the site. Wildlife exposure can result from the ingestion of COCs through food chain transfers and the incidental ingestion of soil from the site. Annex 5-F, Section V, provides additional discussion of the exposure routes and receptors at SWMU 2.

5.9 Site Assessments

The site assessment process for SWMU 2 includes risk screening assessments followed by baseline risk assessments (as required) for both human health and ecological risk. This section briefly summarizes the site assessment results. Annex 5-F describes the assessment in detail.

5.9.1 Summary

The site assessment concludes that SWMU 2 does not have the potential to affect human health under an industrial land-use scenario. After considering the uncertainties associated with

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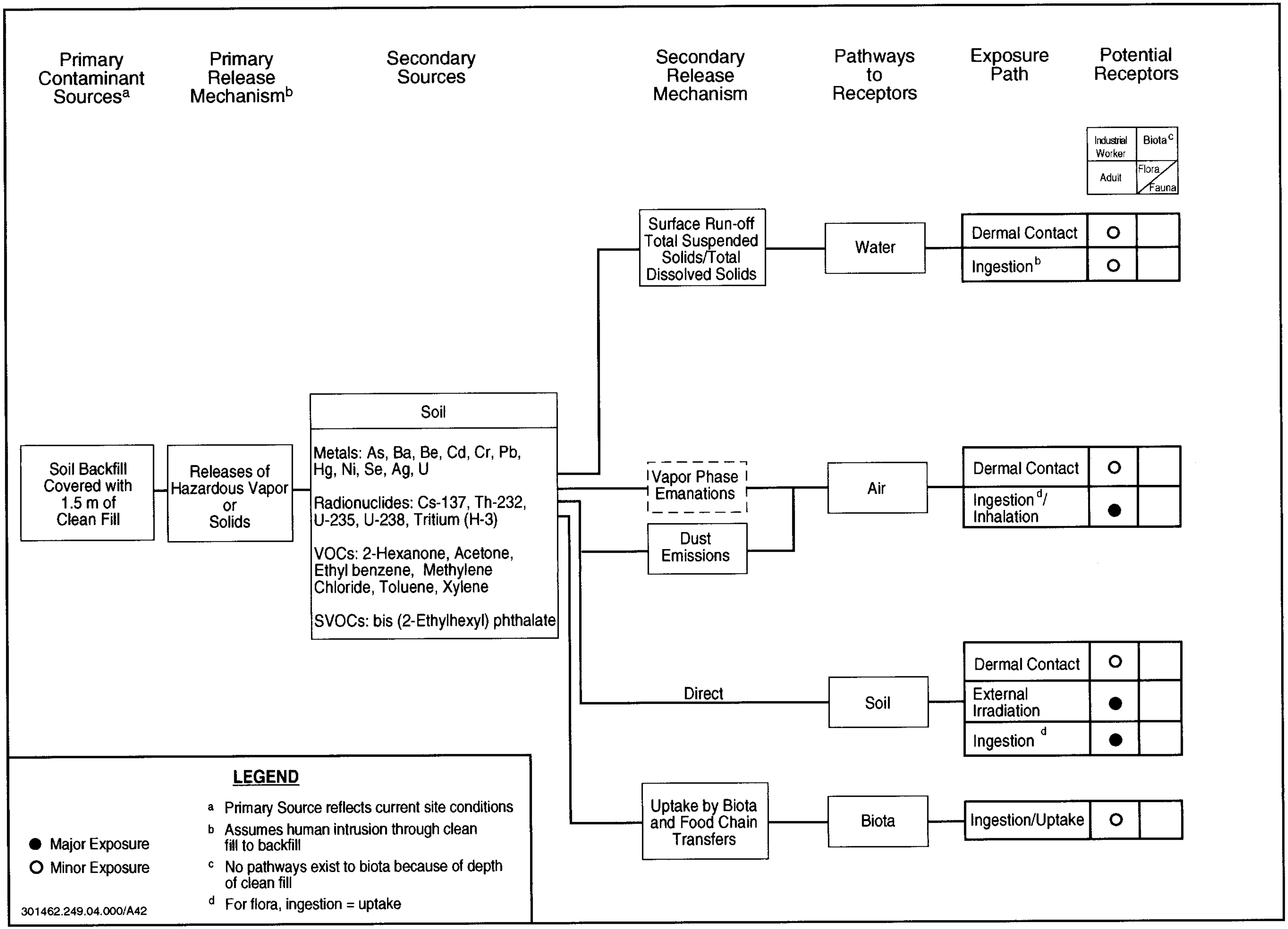

Figure 5.8.21

Conceptual Model Flow Diagram for SWMU 2, Classified Waste Landfill

the available data and the modeling assumptions, ecological risks associated with SWMU 2 were found to be low. Section 5.9.2 describes the site screening assessments and Annex 5-F provides details of the site assessment.

5.9.2 Screening Assessments

Risk screening assessments were performed for both human health risk and ecological risk for SWMU 2. This section briefly summarizes the risk screening assessments.

5.9.2.1 Human Health

SWMU 2 has been recommended for industrial land use (DOE and USAF March 1996). Annex 5-F provides a complete discussion of the risk assessment process, results, and uncertainties.

Because COCs are present in concentrations or activities greater than background levels at the site, it was necessary to perform a human health risk assessment analysis, which provides a quantitative evaluation of the potential adverse human health effects caused by constituents in the site's soil. This assessment included any detected organics and metals and radionuclides detected either above background levels and/or above MDAs. The risk assessment report (Annex 5-F) calculated the hazard index (HI) and excess cancer risk for an industrial land-use scenario. The excess cancer risk from nonradiological COCs and the radiological COCs is not additive (EPA 1989).

In summary, the HI calculated for SWMU 2 for nonradiological COCs is 2 for an industrial land-use scenario, which is greater than the numerical standard of 1.0 suggested by risk assessment guidance (EPA 1989). Incremental risk is determined by subtracting risk associated with background from potential nonradiological COC risk. The incremental HI is 2.36 for the industrial land-use scenario. Although the total and incremental HIs were above the NMED guideline, the HI was conservatively estimated through the use of maximum concentrations of the detected COCs. Because the site was adequately characterized, average concentrations were more representative of actual site conditions. When the upper 95 percent confidence limit of the mean concentration for cadmium and mercury were used in place of their respective maximum concentrations, the total and incremental HIs were reduced to 0.4 and 0.37, respectively. Both values were within NMED guidelines considering an industrial land-use scenario.

The excess cancer risk for SWMU 2 for nonradiological COCs is 5E-06 for an industrial land-use scenario. NMED Guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (NMED March 2000); thus, the excess cancer risk for this site is below the suggested acceptable risk value. The incremental excess cancer risk is 3.30E-06.

The incremental total effective dose equivalent (TEDE) for radionuclides for an industrial land-use scenario for SWMU 2 is 1.9E-2 millirems (mrem)/year (yr). This value is below the recommended dose limit of 15 mrem/yr, found in EPA's Office of Solid Waste and Emergency Response Directive No. 9200.4-18 (EPA 1997a) and reflected in a document entitled, "Sandia National Laboratories/New Mexico Environmental Restoration Project—RESRAD Input

Parameter Assumptions and Justification" (SNL/NM February 1998c). The incremental excess cancer risk for the radionuclides is 3.9E-7 for an industrial land-use scenario.

The residential land-use scenarios for this site are provided only for comparison in the risk assessment report (Annex 5-F). The report concludes that SWMU 2 does not have potential to affect human health under an industrial land-use scenario.

5.9.2.2 Ecological

An ecological screening assessment that corresponds with the screening procedures in the EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997b) was performed as set forth by the NMED Risk-Based Decision Tree (NMED March 1998).

The scoping assessment focuses primarily on the likelihood of exposure of biota at/or adjacent to the site to be exposed to constituents associated with site activities. COCs are present in the soils at SWMU 2 that exceed SNL/NM background screening values. However, all potentially contaminated soil at this site is planned for use as excavation backfill and will covered with an overlying cap of 1.5 meters (approximately 5 feet) of clean fill. Based upon information regarding the limits of biological activity in soils at KAFB (IT July 1998), this cap is expected to be of sufficient thickness to preclude contact between the COCs and biota. Therefore, no complete ecological pathways are expected to exist at this site. As a consequence, a screening assessment was not deemed necessary to predict the potential level of ecological risk associated with the site.

5.9.3 Baseline Risk Assessments

This section discusses the baseline risk assessments for human health and ecological risk.

5.9.3.1 Human Health

Because the human-health screening assessment summarized in Section 5.8.2.1 indicates that SWMU 2 does not have the potential to affect human health under either an industrial or a residential land-use scenario, a baseline human health risk assessment is not required for SWMU 2.

5.9.3.2 Ecological

Because the ecological screening assessment summarized in Section 5.8.2.2 indicates that SWMU 2 has incomplete ecological pathways, a baseline ecological risk assessment is not required for SWMU 2.

5.9.4 Other Applicable Assessments

A formal Surface-Water Assessment has not been conducted at SWMU 2 using the surface-water assessment guidance developed jointly by Los Alamos National Laboratory and the

NMED Surface Water Quality Bureau (LANL August 1998). Since the area surrounding SWMU 2 is flat and the site is over 1,400 feet from the active Tijeras Arroyo channel, the erosion potential is expected to be very low.

5.10 No Further Action Proposal

5.10.1 Rationale

Based upon VCM sampling data and the human health risk assessment analysis, an NFA is being recommended for SWMU 2 because no COCs are present at levels considered hazardous to human health for an industrial land-use scenario. Further soil characterization data and a revised final risk assessment will be submitted as an addendum to this NFA proposal as described in Section 5.0.

5.10.2 Criterion

Based upon the evidence provided above, SWMU 2 is proposed for an NFA decision in conformance with Criterion 5, which states that "The SWMU/AOC has been characterized or remediated in accordance with current applicable state or federal regulations and that available data indicate that contaminants pose an acceptable level of risk under current and projected future land use" (NMED March 1998).

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ANNEX 5-A
Landfill Remediation Process

5A.0 INTRODUCTION

The purpose of the Solid Waste Management Unit (SWMU) 2 Voluntary Corrective Measure (VCM) was to completely remediate the site, rendering it suitable for future industrial land use. Before the start of the VCM remediation, the SWMU 2 VCM Plan was submitted to the New Mexico Environment Department in December 1997 (SNL/NM December 1997). In addition, the plan was presented to the public at a meeting of the U.S. Department of Energy (DOE) Citizens' Advisory Board in November 1997. Site preparation activities were initiated in January 1998, and excavation commenced in early March 1998. Discussions of these and other aspects of the VCM are provided in succeeding sections.

5A.1 PROJECT PLANNING

5A.1.1 Permits

A Topsoil Disturbance Permit was obtained from the City of Albuquerque (COA) because the area to be disturbed exceeded the limit of 0.75 acre. A permit to proceed was secured from the COA per National Emission Standards for Hazardous Air Pollutants regulations. In accordance with the National Environmental Policy Act, a review of the potential impacts of the VCM remediation was filed with Sandia National Laboratories/New Mexico (SNL/NM) (SNL/NM August 1997). Miscellaneous SNL/NM-specific permits, such as a penetration/dig permit, radiation work permits, and a hot work/welding permit were obtained from the appropriate SNL/NM organizations.

5A.1.2 Plans

A set of planning documents was developed prior to the start of excavation activities in March 1998. These included Health and Safety, Security, Excavation, Operations, Waste Management, Sampling and Analysis, and Radiological Safety Plans. All of the documents underwent periodic reviews and updates as changing conditions warranted. Each of these is available for review in the SNL/NM Environmental Health and Safety Records Center.

In August 1997, to facilitate development of the various plans required for the project, a pre-planning meeting was held at which representatives of both DOE and SNL/NM provided input to specific aspects of the VCM. Thus, DOE and SNL/NM counterparts for classification, security, waste management, safety engineering, radiation protection, industrial hygiene, incident command, legal counsel, and other management/oversight organizations were involved in developing the project plans.

5A.1.3 Strategy

The principal VCM activities were (1) the excavation of all buried materials, (2) the separation and management of hazards; (3) segregation of materials into classified vs. non-classified and sorting by part type; (4) segregation of materials based on the potential for recycling and the further segregation of non-recyclable materials into waste categories (hazardous, radioactive, mixed, or nonregulated solid waste) and disposal of same; (5) the demilitarization and disposition of classified materials; (6) confirmatory soil sampling; and (7) backfilling and revegetation of the excavation. A chronology of the excavation process through the verification sampling is summarized in Table 5A.1.3-1 below.

Table 5A.1.3-1
Chronology of VCM Progress at SWMU 2

VCM Activity	Date of Activity
Excavation of the ACF Pits (ACF-1 through ACF-5)	3/4/98–3/20/98, 6/23/98
Excavation of Western Pits (W-1 through W-4)	3/31/98–4/20/98
Excavation of Trench E (E-1 through E-8)	4/29/98–6/4/98
Excavation of Trench D (D-1 through D-8)	6/29/98–9/8/98
Excavation of Trench C (C-1 through C-9)	9/16/98–3/10/99
Excavation of Trench B (B-1 through B-3)	3/24/99–4/13/99
Excavation of Trench A (A-1 through A-3)	5/4/99–7/7/99
Excavation of Trench 1 (1-1 through 1-6)	8/18/99–10/20/99
Excavation of Trench 2 (2-1 through 2-12)	11/8/99–1/18/00
Excavation of Trench 3 (3-1 through 3-10)	7/29/99, 2/2/00–2/17/00
Excavation completed	2/17/00
Characterization of Excavated Soil	Ongoing through project
Waste Management	Ongoing through project
Verification Geophysical Survey	May–July 2000
Verification Soil Sampling	8/7/00–8/10/00

ACF = American Car Foundry.
VCM = Voluntary Correction Measure.
SWMU = Solid Waste Management Unit.

5A.2 SITE PREPARATION

Before any excavation activities could take place at the site, the work areas had to be defined and set up. In anticipation of this activity, several general site preparation activities were necessary. These are discussed in the succeeding sections.

5A.2.1 Utility Identification and Clearance

A dig permit was submitted to the SNL/NM Facilities Group to locate and mark all underground utilities, including gas, water, electricity, communications, and sewer. During the course of this activity, a 10-inch water line was found to be immediately adjacent to the proposed excavation and was directly in line with the western anomalies east of Building 919. The location of this line necessitated shutting off the water supply and cutting the line where it cut through the western anomalies.

5A.2.2 Soil Stockpile Areas

Because of the large volume of soil removed during the excavation, it was necessary to establish "clean" and "interim storage" soil stockpile areas for the project. Thus, an area was located east of the main Technical Area-II fence to stockpile soil characterized as appropriate for backfill; an interim storage area was located near the material handling building south of the landfill proper to maintain potentially contaminated soils within site boundaries.

5A.2.3 LAGS and Material Handling Building

A large temporary structure was erected on the south end of the site in January 1998 to house the Large Area Gamma Spectroscopy (LAGS) system. Further discussion of the LAGS setup is provided in Section 5.6.2.2. As the project progressed and it became clear that no large amounts of radioactively contaminated soil were being generated, the LAGS system was dismantled, and the material handling function was moved into the structure in January 1999.

5A.2.4 Screen Plant

The need to separate rock and small debris from the excavated soil to allow characterization prompted the installation of a screenplant that also sorted the rock and debris by size fraction. The size fraction separation allowed the rock and debris to be sorted again later to remove any remaining classified or hazardous items prior to using the rock for backfill.

5A.3 EXCAVATION PROCESS

The excavation strategy was based on the latest geophysical survey and available historical records. The ACF and the W-Pits were excavated first because the limited process knowledge available on those disposals gave no indication of any hazards associated with the contents. Because it was assumed from the historical records that the least-contaminated items were buried last (since they reportedly underwent a radiological and chemical screening prior to burial), the excavation proceeded from youngest trenches backward through time to the oldest disposals cells. The youngest trenches were located in the northern portion of the landfill (Trench E); thus, the excavation proceeded from north to south from Trench E to Trench 3 and from pit to pit within each trench. This accomplished the dual goals of excavating the less complicated areas (from a material management standpoint) first, thus allowing the excavation and material handling crews to refine their work flow processes prior to encountering more difficult areas.

Each pit was assigned an identifier to ease the tracking of materials and excavation progress. The original numbering scheme was adhered to, but was supplemented because of the additional, distinct pits identified through the geophysical surveys. Thus, as indicated in Table 5.1.4-1, five ACF Pits, four W-Pits, Trenches A through E, and Trenches 1 through 3 were labeled with individual pits identified in each.

Once materials were identified, classified databases were searched and subject experts were contacted to assist with determining proper hazard mitigation procedures and current level of security classification, and to review options for the ultimate disposition of components and materials. Because the current classified weapons component databases do not specifically identify all the hazards associated with a particular item, project personnel compiled information gained from the material characterization effort to increase the future usability of such databases.

Approximately 50,000 cubic yards of soil were excavated from the landfill between March 1998 and February 2000, when the excavation was completed. Depth of the excavation ranged from 10 to 20 feet, with an average depth of approximately 12 feet. The north side of the excavation was used as an equipment ramp and was sloped to allow access.

The strategy for defining the vertical and lateral extent of each pit area was to continue excavating until:

- No visible debris remained,
- Metal detector surveys indicated that no metallic debris remained buried, and
- All fill material was removed down to natural deposits.

Measures to verify that the VCM was complete included the proceeding, plus the following:

- Geophysical surveys indicated no non-native materials remained buried, and
- Confirmatory soil sampling indicated only background or risk-based levels of constituents of concern (COCs) remained.

5A.3.1 Excavation

Because of the potential for unknown hazards in the landfill (radiological, chemical, and explosive), the overburden, which varied in thickness from 1.5 to 6 feet was carefully removed with an excavator from each disposal cell and separated. The overburden was expected to contain little or no contamination. The overburden soil was screened and sampled for chemical and radiological hazards, then set aside for use as backfill at the end of the project. No contaminated overburden or sloping material was identified during the excavation.

After removal of the overburden, the soil and debris was dug out pit by pit, with the excavator operator looking for compressed gas cylinders, unexploded ordnance, or other immediate hazards. Any items suspected of being an immediate threat to worker safety were investigated and rendered safe before further movement. The soil and debris were then moved out of the pit with a loader for further examination.

5A.3.2 Laydown Procedures

A more thorough examination and screening of the material excavated was conducted at the Laydown Area. Excavated materials were spread on the ground to an approximate depth of 6 inches.

The material was then closely surveyed for any items that posed an immediate hazard to personnel. First an explosives expert looked for potentially explosive items, then the soil and debris were checked for volatile organic compounds (VOCs) using a photoionization detector (PID), and radiation technicians performed surveys for loose and/or fixed contamination.

Thermal Environmental Instruments Inc. PIDs 580 EZ and 580B with 10.6 eV lamps were used for this project. The detectors were used to monitor for VOCs during laydown operations in the breathing zone and in direct contact with soil and debris. The PID monitoring results did not detect any organic vapors above background levels for soil surveyed during laydown operations for the entire excavation. A few rubber components and containers did indicate VOC emissions when unwrapped or opened.

The radiological instruments used to survey the debris and soil at laydown for radioactive material were selected to detect all radiological COCs except tritium. The instrumentation consisted of the following. Ludlum model 2221 ratemeters (coupled to both a Ludlum model 44-10 2x2 gamma scintillometer and a Bicron FIDLER gamma scintillometer) measured both gamma and low energy gamma emissions and x-rays; a Ludlum model 19 microR meter monitored dose rates and detected x-rays; and a Ludlum model 12 ratemeter coupled to a Ludlum model G-10-2 neutron probe measured neutron emissions.

After any hazards identified were safed and/or isolated, the other components were removed and placed in bins for further surveying, cleaning and sorting at another material handling area.

5A.3.3 Soil and Debris Screening

After the surveys and debris removal at the Laydown Area, the remaining material (soil, cobble, and small debris) was removed from the area using a loader and processed through the screenplant for separation by size. Additional hand sorting was performed to separate the debris from the cobble. The debris separated from the screened cobble was then sent to the material handling area for processing.

5A.3.4 Material Sorting and Segregation

At the material handling area, items were sorted by hand and checked a second time for radiological components or loose contamination and other hazards. They were then separated into process streams based on their type (thermal batteries, firing sets, neutron generators, capacitors, trainers, and so forth) and level of classification. The material was then submitted to another radiological survey area to be checked a third time for radioactive material prior to unrestricted release. The last survey was the official survey of record performed by SNL/NM Radiation Control Technicians. The items confirmed to be free of radiological contamination were sorted further into demilitarization, recycling, or disposal streams. Items not qualifying for unrestricted release or that could not be effectively decontaminated were segregated for disposal as radioactive waste. Items destined for demilitarization and/or recycling were separated from those destined for disposal as waste (e.g., soft waste - foam, paper, and plastics, glass, as well as hazardous waste items like thermal batteries and capacitors, etc.). Material that could not be recycled and was not regulated waste was disposed as solid waste.

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SNL/NM, see Sandia National Laboratories/New Mexico.

ANNEX 5-B
Landfill Debris Disposition

5B.1 MATERIAL HANDLING AND DISPOSITION

Approximately 1.5 million pounds of debris were removed from the landfill. All of this material required careful consideration as to security classification, recycle value, and waste categorization. The objective of the material handling and disposition phase of the project was to remove from classification or reapply as much of the unregulated landfill debris as possible. Disposition included extensive recycling efforts, rather than simply transferring the material to a permitted landfill.

Excavation and subsequent component identification indicated that approximately 90 percent of the landfill contents were still considered classified from a national security standpoint. Many of the classified components contained radioactive, hazardous, and/or explosive material, increasing the complexity of disposition. Because classified components have to be demilitarized (destroyed to prevent recovery of sensitive information) prior to final disposition, the demilitarization process dovetailed well with recycling. Approximately 70 percent (by weight) of the classified artifacts were processed to recover recyclable metals during the demilitarization process.

After items were checked for hazardous or radioactive contamination or internal components, they were separated based on their ability for reuse or recycle. The material exhumed during the excavation consisted of a wide variety of individual parts and assemblies from the many weapon systems Sandia National Laboratories/New Mexico (SNL/NM) was involved with in a design or test capacity. The parts ranged from very small components such as circuit boards, relays, diodes, actuators, magnetic coils, computer chips, condensers, capacitors, switches, transistors, cables and wiring, to complete electronic assemblies, metal shapes of all types, neutron generators, nose cones, radar sets, firing sets, artillery and mortar rounds, and penetrator tips, to dies weighing thousands of pounds. Both production versions and a variety of prototype models of components and assemblies from different weapon systems were disposed in the landfill. Complete weapon mock-ups (including those of the B-14, B-53, W-28, W-30, W-52, W-53, W-55, and W-56 weapon systems) that allowed testing of entire assemblies or for use in training were exhumed.

5B.1.1 Strategy

At the beginning of the project, it was believed that a large percentage of the artifacts removed from the landfill could be recycled or reapplied, either in part or as complete items. Thus, a strategy was developed to allow the identification of such items and establish the framework in which to accomplish this goal. Recycling or reapplication, coupled with demilitarization when necessary, was pursued as an option for several reasons:

- Recycling was preferable and more cost effective than simply reburying the material in a permitted landfill.
- Many items, being classified, required demilitarization (i.e., destroying a part to render it unrecognizable and unusable). To add the recycling step was natural, since the material would be ready for recycle.

- The cost to dispose of classified waste is an order of magnitude higher than the cost for unclassified waste. Thus, demilitarization with the intent to recycle became very attractive from a budget standpoint.

- There was no option available at the time for disposing of items as classified mixed waste. Thus, wherever possible, removing the radioactive or hazardous component to prevent an item from becoming mixed waste provided an avenue for disposal that would not otherwise exist.

Demilitarization and recycling was planned for the majority of items removed from the landfill. This was to apply wherever recycling was a viable option. Items with no recycle value (e.g., bags of powder, capacitors, thermal batteries, etc.) were managed throughout the process as waste. The management of waste material is discussed more fully in Section 5B.2.

5B.1.2 Material and Data Management and Tracking System

In order to facilitate tracking of materials removed from the landfill, and to track the analytical data associated with materials and soils, a material and data management system (MDMS) was developed. The database was used to track material as it was processed through the system of characterization surveys and disposition decisions.

As material was processed through the sorting and segregation process, it was assigned a unique identifier in the MDMS to track where the item was in the system, what surveys still needed to be performed, what the results of the surveys were, and where it was being stored. As a determination on final disposition was made for each item, this information was added to the MDMS.

The MDMS was also used to enter field-screening data for soil characterization, to track analysis request/chain-of-custody records, and which analyses were requested for each sample submitted, whether soil or waste characterization. Thus, it was possible to tie a particular analytical result to a particular item or group of items and determine whether characterization was complete and when the data could be expected to arrive.

Another feature of the MDMS was to keep track of the types of materials removed and their ultimate disposition so approximate numbers and weights of items for each disposal path could be tracked. For example, to determine the number of items and groups of items submitted in a particular month for recycling and the total weight of those artifacts required only a simple query to retrieve the information.

5B.1.3 Classification and Security

5B.1.3.1 Handling and Storage of Classified Items

In order to follow security requirements for classified material, all artifacts were assumed to be classified until proven otherwise.

5B.1.3.1.1 Staging of Classified Materials

Those items known to be classified, or not yet proven otherwise, were stored in locked and alarmed buildings and transportainers during non-work hours. Several different categories of items were identified in the site security plan which required separate storage if they were discovered during excavation. The following categories were set up for the storage of specific items:

- Special nuclear material
- Firearms (e.g., handguns, rifles, shotguns)
- Precious metals (in significant quantities)

Categories added after the start of the project included securing radioactively-contaminated classified material separately from other classified material.

5B.1.3.1.2 Identification of Classified Items

As items were removed from the excavation and processed through the various stages of handling and segregation, many items were categorized as to their classification level using databases developed by SNL/NM weapons groups. In those cases where no identifying marks were apparent or when serial numbers were missing or obscured, weapon experts were consulted to identify components and make classification determinations. This information was added to the project database for reference throughout the project.

5B.1.4 Demilitarization Process

The demilitarization process was established in accordance with U.S. Department of Energy (DOE) guidance (DOE June 1998). The process consisted of identifying the components and any associated hazards; sorting to remove unclassified material; separation to remove hazardous and/or radioactive items; disassembly to remove unclassified portions and access waste material; then shredding, sawing, rubblizing, or melting the remaining components prior to disposal as solid waste or metals recovery through recycle. The high-quality electronic components contained attractive quantities of precious metals and the weapon mock-ups and prototypes produced significant amounts of the more common metals.

After identification, and once their internal structures were understood, the more complex assemblies were dismantled to remove any radioactive parts or hazardous materials such as batteries, capacitors, lead-containing ceramics, beryllium, mercury switches, sealed radioactive sources, or asbestos prior to demilitarization.

If disassembly was not feasible or cost-effective, components were opened up or reduced in size by bandsaw, pneumatic chisel, chopsaw, oxy-acetylene torch, jackhammer, oxygen lance, or plasma torch. The weapon casings were generally not considered classified, so disassembly permitted significant volume reduction and grouping of similar components such as metal shapes, capacitors, batteries, or smaller assemblies requiring shredding. Approximately 30,000 pounds of aluminum, brass, copper, and stainless steel components were classified by their shape and configuration; these were separated and melted in an induction furnace at SNL/NM, producing ingots that were sold to a recycler.

5B.1.5 High-Risk Material

Approximately 10 percent of the volume excavated consisted of unclassified material, primarily metal shapes or parts that were never classified or were no longer considered classified. The unclassified components, because they were associated with weapon systems are considered high-risk property if they are in good enough condition to be reused. High risk property must be rendered unusable for the original intended purpose, per DOE guidance (DOE June 1998). This is accomplished by crushing items with an excavator bucket or using a chopsaw, acetylene torch, jackhammer, or oxygen lance to cut them apart. The unclassified metals components resulting from the disassembly process have recoverable value and are easily recycled. The types of metal with recoverable value include stainless steels, aluminum, magnesium, copper, brass, cast iron, and carbon steel. Once this material was identified, separated from the classified components, and certified to be free of radioactive contamination, it was loaded into roll-off containers for disposition by a local metals recycling contractor.

5B.1.6 Recycling

Approximately 70 percent of the classified material removed from the landfill contained a variety of metals that could be recycled and reused. If the product of the demilitarization process was composed primarily of common metals, a local recycler purchased the material for a nominal fee. The common metals included mild steel, cast iron, cadmium, lead, stainless steel, magnesium, copper, titanium, aluminum, brass, tin, and zinc. These came from weapons casings, molds, and other weapon components, lead sheet and shapes, wire, cable, and tubing. As of May 2001, approximately 800,000 pounds of unclassified metal were sold to a local metal recycler. In addition, numerous nickel-cadmium batteries were recovered from the landfill. Approximately 50,000 pounds of nickel-cadmium batteries were recycled.

If the demilitarized material consisted primarily of electronic components, the resulting material was shipped to a smelter specializing in the extraction of precious metals such as gold, silver, platinum, tantalum, and palladium. The sale of these metals returned some nominal funding to SNL/NM to support the demilitarization process.

Classified material for which demilitarization processes were not available or which could not be readily identified were stored in a secure bunker in Manzano Base until disposition options were available.

5B.1.7 Materials Reapplication

Not all the classified weapon components from the landfill required demilitarization. Some weapon mock-ups or components were from weapon systems that have been removed from the U.S.'s nuclear stockpile. A number of the items were determined to have some historical value and were transferred to the classified weapons display at the Kirtland Air Force Base (KAFB) Defense Nuclear Weapons School. A few components were reapplied through a SNL/NM weapon systems training organization. A joint Los Alamos National Laboratory and SNL/NM program preparing specialized response teams for explosive and nuclear incidents acquired some weapon mock-ups for training purposes. A few components or assemblies that were no longer classified but had some historical value and were still in good shape were released to the National Atomic Museum on KAFB for display. These were the most cost-effective disposition options but only accounted for a small fraction of the material excavated.

5B.2 WASTE HANDLING AND DISPOSITION

5B.2.1 Waste Management Overview

The objective of the waste management portion of the project was to characterize material with no recycle value for radiological or chemical contamination so it could be placed in the appropriate waste stream. For those materials that were hazardous (e.g., thermal batteries), the ability to demonstrate that they were not also radioactive averted disposal of the material as mixed radioactive and hazardous waste, a more complex waste stream. Demilitarization played a significant role in this arena, for there is currently no disposal option for classified mixed waste. Items that were found to have fixed or loose radioactive contamination or that contained radioactive sources that could not be separated from the component (less than 0.5 percent of all items removed) had to be characterized for disposal as radioactive waste.

5B.2.2 Waste Streams and Volumes

By-products of the disassembly and demilitarization effort were components, both classified and unclassified, with no recoverable value, containing hazardous and/or radioactive materials, that had to be categorized as waste. The major residual waste streams from disposition of the classified material from the landfill are briefly discussed below.

Various classified and unclassified waste types have been produced to date. These include Resource Conservation and Recovery Act (RCRA), RCRA/Toxic Substances Control Act (TSCA), radioactive, mixed hazardous and radioactive, and solid waste. Table 5B.2.2-1 summarizes the various types of wastes and recycled materials processed to date. Descriptions of the waste categories are given below.

5B.2.2.1 RCRA Hazardous Waste

The largest hazardous waste stream generated in the course of the project were expended thermal batteries developed at SNL/NM for nuclear weapons. Other forms of hazardous wastes included capacitors, silver-zinc batteries, mercury batteries, fibrous materials, mock high explosives (HE), soft waste, powders, liquid mercury, and mercury switches. The material, hazardous constituents, and approximate weights of each type of waste are summarized in Table 5B.2.2.1-1 and brief descriptions of each waste category are provided below. Approximately 177,000 pounds of unclassified hazardous waste was characterized and packaged for disposal. No classified hazardous wastes were generated.

Table 5B.2.2-1
Summary of Estimated Weights for Waste Materials

Classified Waste	Approximate Weight (pounds)
Low-level radioactive	2,000
Mixed hazardous and radioactive	8,000
Total	12,000
Unclassified Waste	
Low-level radioactive	20,000
RCRA hazardous	177,000
Mixed hazardous and radioactive	1,000
RCRA/TSCA	7,000
Solid	92,000
Total	297,000
GRAND TOTAL	307,000

RCRA = Resource Conservation and Recovery Act.
TSCA = Toxic Substances Control Act.

Table 5B.2.2.1-1
Summary of RCRA Hazardous Wastes

Waste	Hazardous Constituent(s)	Approximate Weight (pounds)
Thermal Batteries	Asbestos, barium, cadmium, chromium, lead	130,000
Capacitors	Lead	20,000
Silver-Zinc Batteries	Silver	6,000
Mercury Batteries	Mercury	5,000
Fibrous Materials	Phenols	5,000
Mock HE	Barium	4,000
Soft Waste	Cadmium, lead, mercury	5,000
Powders	Barium, cadmium, chromium, and lead	1,000
Hg and Hg Switches	Lead, mercury	1,000
Total		177,000

HE = High explosives.
Hg = Mercury.
RCRA = Resource Conservation and Recovery Act.

5B.2.2.1.1 Thermal Batteries

Approximately 130,000 pounds of thermal batteries representing 90 different models were excavated and managed as waste. Although thermal batteries were classified when disposed, all types found in the landfill are now unclassified.

A thermal battery is an electrochemical power supply with a fused salt electrolyte. The batteries are essentially inert at normal room temperature and are activated by supplying sufficient heat to melt the electrolyte. Under normal operation, heat is supplied internally by a pyrotechnic heat source. The batteries are hazardous when disposed due to the presence of barium, cadmium, chromium, and/or lead. Each particular model may have some or all of these RCRA metals. Additionally, approximately 70 percent of the thermal batteries handled contain asbestos, a TSCA waste. The different metals present in different types, and the potential for asbestos required careful sorting of the batteries by type.

A handling process was developed to verify that all the thermal batteries were expended before disposal. Batteries were visually checked for physical breaches of the battery case. Because the internal components of the battery are compromised by water intrusion, any battery with a punctured outer case was considered inert. Any battery found with a "Fired" label was considered expended. SNL/NM performed extensive research and development of thermal batteries for 40 to 50 years. It was standard practice for the testing laboratory to mark expended batteries as "Fired".

For unbreached batteries, several methods were used to verify that they were expended. Batteries with intact connector pins were tested with a portable digital ohmmeter to check the resistance of the battery circuits. SNL/NM organizations provided expert technical assistance and guidance in testing the thermal batteries. Unbreached batteries with missing connector pins were sent to an SNL/NM X-ray facility. Each battery was X-rayed and an experienced X-ray and thermal battery technician inspected the films to verify that each battery was fired. A few unfired batteries were found but they were subsequently fired by the thermal battery technician in a controlled environment.

5B.2.2.1.2 Capacitors

Thirty-five different types of capacitors were excavated at Solid Waste Management Unit (SWMU) 2. Approximately 20,000 pounds of capacitors were processed. Capacitors are hazardous waste due to the presence of lead. Additionally, approximately 5 percent of the capacitors contained polychlorinated biphenyl (PCB) concentrations above the regulatory limit.

Capacitors were sorted according to model number. A photograph of each unique capacitor was taken to facilitate identification of different models as they were excavated. Each model number was then analyzed for PCBs. Intact capacitors were considered high risk property and had to be rendered unusable by puncturing the layers.

5B.2.2.1.3 Silver Zinc Batteries

Approximately 6,000 pounds of silver zinc batteries were excavated from the landfill. Silver and potassium hydroxide were the primary hazardous constituents. Additionally, the batteries contained an explosive squib that is fired, puncturing a diaphragm and allowing the potassium hydroxide electrolyte to mix in the cells and activate the battery. These batteries also were X-rayed to verify if they were expended. If the X-ray results were uncertain, the batteries were opened and destroyed to verify that they were inert.

5B.2.2.1.4 Mercury Batteries

Approximately 5,000 pounds of mercury (mercuric oxide) battery stacks and cells were excavated from the landfill. The primary hazard in these batteries is mercury.

5B.2.2.1.5 *Fibrous Materials*

Approximately 5,000 pounds of resin-coated fibrous materials in bags, boxes, and barrels were excavated from the landfill. Analysis revealed that the hazardous constituents were phenols. Additional analysis showed that these batteries did not contain asbestos and they were disposed as hazardous waste.

5B.2.2.1.6 *Mock High Explosives*

Approximately 4,000 pounds of mock HE were excavated from the landfill. Mock HE is a pink, solid, barium nitrate material used to simulate explosives in weapon assemblies. The material has many physical properties similar to those of high explosives but is not explosive. The material was categorized as a hazardous waste due to the high concentrations of barium. Mock HE was visually detected in materials excavated from the landfill or during dismantling of large assemblies, segregated, and packaged for disposal. Containers of accumulated mock HE were sampled for gamma spectroscopy and tritium analysis. Most of the mock HE found at SWMU 2 was considered hazardous waste only; however, a small percentage was managed as mixed waste due to tritium contamination.

5B.2.2.1.7 *Soft Waste*

Approximately 5,000 pounds of hazardous soft waste was generated. The term soft waste was given to material consisting of scrap paper, plastic sheeting, soft foam, rigid foam, flexible tubing, polyvinyl chloride, and wood removed from the landfill. Due to the heterogeneous nature of this type of material, each container was sampled for heavy metal contamination. Containers that did not exceed any regulatory limits were processed as low-level radioactive waste; containers that did prove to be hazardous waste were returned to SWMU 2. The soft wastes were removed from the drums, carefully surveyed and sorted to remove any radiologically-contaminated materials and then a SNL/NM Radiation Control Technician performed a radiological survey to verify that no radioactive contamination existed. The container was then processed as RCRA-hazardous waste.

5B.2.2.1.8 *Powders*

A small amount (approximately 1,000 pounds) of hazardous powders was recovered from the landfill. Powders were generally found in containers and therefore handled separately as they also had to be analyzed for ignitability. These powders contained cadmium, lead, barium, and/or chromium and were considered RCRA-hazardous.

5B.2.2.1.9 *Mercury and Mercury Switches*

Approximately 1,000 pounds of liquid mercury and mercury switches were recovered from the landfill. The majority of this waste was a particular model of mercury switch containing mercury and lead.

5B.2.2.2 *Low-Level Radioactive Waste*

Approximately 20,000 pounds of unclassified radioactive waste was produced during the SWMU 2 Voluntary Corrective Measure. The majority of this waste was radioactively-contaminated metal, soft debris, and personnel protective equipment (PPE) with lesser amounts of other contaminated materials. Depleted uranium and tritium were the most common radioactive contaminants.

A lesser amount of classified radioactive waste was produced. The 2,000 pounds of classified radioactive waste was tritium-contaminated beryllium material.

5B.2.2.3 Mixed Hazardous and Radioactive Waste

Approximately 1,000 pounds of unclassified mixed waste were produced as a result of landfill activities. This waste consisted of electronic components containing lead, tritiated mock HE, and small quantities of contaminated capacitors and thermal battery fragments.

Approximately 8,000 pounds of classified neutron generators were retrieved from the landfill. Neutron generators are considered mixed hazardous and radioactive waste due to tritium and lead constituents. However treatment to separate the tritium component and demilitarization are available at SNL/NM in a permitted facility.

5B.2.2.4 RCRA/TSCA Wastes

Approximately 7,000 pounds of RCRA/TSCA mixed waste were produced. These wastes consisted of PCB-containing capacitors and small transformers.

5B.2.2.5 Solid Waste

Material that qualified as solid waste included PPE, magnetic tape containers, fabrics, wood, paper, cardboard, cement, foam, fiberboard, ceramics, plastics, and firearms. This material was unclassified or could be demilitarized and had no recyclable value. The waste stream was disposed as nonregulated or solid waste and was sent to the KAFB landfill. A total of approximately 92,000 pounds was released from the site and disposed of as solid waste.

5B.2.2.5.1 Electronic Media Tapes

Approximately 25,000 pounds of reels of magnetic computer tape were excavated from SWMU 2. It was assumed there might be classified information contained on the tapes. The tapes were surveyed for any chemical or radiological contamination then SNL/NM Mail Services shredded and disposed of the material as solid waste.

5B.2.2.5.2 Firearms

A small amount of disfigured firearms and related parts were found in the landfill. Included were handguns, rifles, shotguns, and automatic weapons. Approximately 300 pounds of assorted firearms and components were transferred to the Alcohol, Tobacco, and Firearms Agency to complete their destruction at an explosive test range.

5B.2.3 Waste Characterization

The objective of the waste characterization effort was to sufficiently characterize waste material to determine the appropriate waste category and to ensure that waste acceptance criteria for a particular disposal site were met. Characterization of waste generated during the landfill excavation was determined using process knowledge and/or sampling and analysis. In those cases where sufficient historical information was available about a given artifact, process knowledge could be used to characterize waste streams when one or more of the following conditions were present:

- A waste stream was difficult to sample because of its physical form.
- Sampling and analysis of a particular waste stream could have resulted in unacceptable risk of radiation or chemical exposure.
- The waste was too heterogeneous in composition to adequately characterize by sampling and analysis.

The majority of the waste streams generated were solid in nature. Minimal amounts of liquid wastes were generated and consisted of waste oil from heavy equipment and small volumes of capacitor and transformer oils emptied from components.

REFERENCES

DOE, see U.S. Department of Energy.

U.S. Department of Energy (DOE), June 1998. "Guidance on Demilitarization and Sanitization for Disposition of Nuclear Weapon Components and Related Materials," Office of the Deputy Assistant Secretary for Military Application and Stockpile Management, U.S. Department of Energy, Albuquerque, New Mexico.

ANNEX 5-F
Risk Screening Assessment

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SWMU 2: RISK SCREENING ASSESSMENT REPORT

I. Site Description and History

Solid Waste Management Unit (SWMU) 2, the Classified Waste Landfill, Operable Unit 1303, at Sandia National Laboratories/New Mexico (SNL/NM), comprises approximately 1.5 acres at an average elevation of 5,415 feet above sea level. The site is located on the piedmont-slope alluvium immediately west of the northern rim of Tijeras Arroyo. The site is on land owned by Kirtland Air Force Base (KAFB) and leased to the U.S. Department of Energy (DOE). The Classified Waste Landfill (SWMU 2) was established inside SNL/NM Technical Area (TA)-II and was used to bury classified material.

Environmental concern about SWMU 2 is based upon the disposal of weapons parts and material in unlined pits and trenches from the 1950s to 1987, although the earliest burials may have been in 1947. The individual trenches were approximately 8 to 12 feet wide and 12 feet deep and varied in length from approximately 100 to 300 feet. The individual pits were between 12 and 18 feet deep. The trenches and pits were covered with 1 to 4 feet of soil.

The annual precipitation for the area, as measured at the Albuquerque International Sunport, is 8.1 inches. No springs or perennial surface-water bodies are located in the vicinity of the site. During most rainfall events, rainfall quickly infiltrates the soil at SWMU 2. However, virtually all of the moisture subsequently undergoes evapotranspiration. The estimates of evapotranspiration for the KAFB area range from 95 to 99 percent of the annual rainfall.

The vicinity of SWMU 2 has been heavily disturbed and is unpaved with little native vegetation. The area is essentially flat, and no storm sewers are used to direct surface water in this area. Tijeras Arroyo is the most significant surface-water drainage feature at KAFB and the west bank of the arroyo is approximately 400 feet east of SWMU 2. The arroyo originates in Tijeras Canyon, which is bounded by the Sandia Mountains to the north and the Manzano Mountains to the south. The arroyo trends southwest and eventually drains into the Rio Grande.

Based upon data from monitor wells at TA-II, a perched groundwater zone occurs above the regional aquifer beneath SWMU 2. The depth to the perched zone is approximately 267 to 320 feet below ground surface (bgs), while the depth to the regional aquifer is approximately 520 feet bgs. The closest down-gradient production well is KAFB-1, located approximately 1.4 miles northwest of the site.

II. Data Quality Objectives

The Data Quality Objectives (DQOs) presented in the SWMU 2 Voluntary Corrective Measure (VCM) plan identified the excavated soil field screening and sampling and confirmatory sample locations, sample depths, sampling procedures, and analytical requirements. The DQOs outlined the Quality Assurance (QA)/Quality Control (QC) requirements necessary to produce defensible analytical data suitable for risk-assessment purposes. The excavated soil characterization and excavation confirmatory sampling conducted during the SWMU 2 VCM were designed to:

- Determine whether hazardous waste of hazardous constituents were ever released at the site;

- Characterize the nature and extent of any releases;

- Monitor constituent of concern (COC) concentrations for health and safety and waste management decisions; and

- Provide analytical data of sufficient quality to support risk screening assessments and justify using the excavated soil as backfill for the excavation.

Table 1 summarizes the rationale for the sampling pattern. The source of potential COCs at SWMU 2 was the material buried in pits and trenches at the landfill.

Table 1
Summary of Sampling Performed to Meet DQOs

SWMU 2 Sampling	Potential COC Source	Number of Sampling Locations	Sample Density (samples/acre)	Sampling Location Rationale
Excavated soil from pits and trenches.	Buried material	1 sample per 10 or 50 cubic yards	NA	Evaluate excavated soil for evidence of COC release, waste management, H&S, and for possible use as backfill.
Bottom of nine individual pits and bottom and sidewalls of excavation after material and soil removal.	Buried material	50	0.05	Evaluate soil at the bottom of the excavation and pits to ensure the VCM was complete.

COC = Constituent of concern.
DQO = Data Quality Objective.
H&S = Health and Safety.
NA = Not Applicable.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.

Samples of the excavated soil were collected for field-screening and laboratory analysis throughout the project. Field-screening included: volatile organic compound (VOC) headspace analysis by photoionization detector, metals by x-ray fluorescence, and radionuclides by large-area gamma spectroscopy. Laboratory analyses included: VOCs, semivolatile organic compounds (SVOCs), high explosives (HE), metals, gamma spectroscopy, and tritium. Sample numbers and frequency changed throughout the project based upon number of nondetects, indications of possible contamination, or waste characterization needs.

VCM confirmatory soil samples were analyzed for metals, VOCs, SVOCs, radionuclides, and tritium. The samples were analyzed by General Engineering Laboratories Inc. (GEL) and the on-site SNL/NM Radiation Protection Sample Diagnostic (RPSD) Laboratory. Table 2 summarizes the number and types of confirmatory samples at SWMU 2. Table 3 summarizes the analytical methods and some of the data quality requirements from the SWMU 2 VCM plan.

QA/QC samples were collected during the VCM and confirmatory sampling efforts in accordance with the Environmental Restoration (ER) Project Quality Assurance Project Plan. The QA/QC samples consisted of duplicates and off-site laboratory splits. Equipment-wash (aqueous rinsate) blanks were collected at the start of the project and during the confirmatory sampling phase of the project. No significant QA/QC problems were identified in the QA/QC samples.

All of the excavated soil characterization and confirmatory soil sample results were verified/validated by SNL/NM. The off-site laboratory results from GEL were validated according to "Data Validation Procedure for Chemical and Radiochemical Data SNL/NM Environmental Restoration Project Analytical Operating Procedure (AOP) 00-03, Rev. 0" (SNL/NM December 1999). The data validation reports are presented in the associated SWMU 2 no further action (NFA) proposal. The gamma spectroscopy data from the RPSD Laboratory were reviewed according to "Laboratory Data Review Guidelines, Procedure No: RPSD-02-11, Issue No: 02" (SNL/NM July 1996). The gamma-spectroscopy results are presented in the NFA proposal. The reviews confirmed that the analytical data are defensible and therefore acceptable for use in the NFA proposal. Therefore, the DQOs have been fulfilled.

III. Determination of Nature, Rate, and Extent of Contamination

III.1 Introduction

The determination of the nature, migration rate, and extent of contamination at SWMU 2 was based upon an initial conceptual model validated with VCM excavated-soil characterization and confirmatory sampling at the site. The initial conceptual model was developed from archival research and aerial photographs. The DQOs contained in the SWMU 2 VCM plan identified the excavated soil sample frequency, VCM confirmatory locations, sample depth, and analytical requirements. The sample data were subsequently used to develop the final conceptual model for SWMU 2, which is presented in Section 3.5 of the associated NFA proposal. The quality of the data specifically used to determine the nature, migration rate, and extent of contamination are described below.

III.2 Nature of Contamination

Both the nature of contamination and the potential for the degradation of COCs at SWMU 2 were evaluated using laboratory analyses of the soil samples (Section V). The analytical requirements included analyses for metals, VOCs, SVOCs, HE, and radionuclides. The

Table 2
Number of Soil Samples Collected during the SWMU 2 VCM Excavation and Confirmatory Sampling, March 1998 to August 2000

Sample type	RCRA Metals + Be, Ni, U	VOCs	SVOCs	HE	Gamma Spectroscopy	H-3
Excavated soil	318–368[a]	104	1	4	391	154
VCM Confirmatory	50	8	8	–	50	50
Duplicates	58	10	–	4	12	14
Off-site Splits	15	9	–	2	–	–
Equipment Blanks (includes Trip Blanks for VOCs only)	11	22	6	–	9	6
Total Samples	452–502[a]	153	15	10	462	224
Analytical laboratory	ERCL, GEL	ERCL, GEL	GEL	ERCL, GEL	RPSD	RPSD, GEL

[a]Not all soil samples analyzed for all analytes.
ERCL = Environmental Restoration Chemistry Laboratory.
GEL = General Engineering Laboratories Inc.
H-3 = Tritium.
HE = High explosive(s).
RCRA = Resource Conservation and Recovery Act.
RPSD = Radiation Protection Sample Diagnostics.
SVOC = Semivolatile organic compound.
SWMU = Solid Waste Management Unit.
VCM = Voluntary Corrective Measure.
VOC = Volatile organic compound.
– = No samples.

Table 3
Summary of Data Quality Requirements

Analytical Requirement	Data Quality Level	ERCL	GEL	RPSD
RCRA metals + Be, Ni, U EPA Method 6010/7000	Defensible	304 samples[a]	73 samples	–
VOCs EPA Method 8260	Defensible	112 samples	11 samples	–
SVOCs EPA Method 8270	Defensible	–	9 samples	–
HE compounds EPA Methods 8330, 8095	Defensible	4 samples	2 samples	–
Gamma Spectroscopy EPA Method 901.1	Defensible	–	–	441 samples
Tritium EPA Method 906.0	Defensible	not analyzed	52	204 samples

Note: The number of samples does not include QA/QC samples such as duplicates, trip blanks, and equipment blanks.
[a]Not all soil samples analyzed for all analytes.
EPA = U.S. Environmental Protection Agency.
ERCL = Environmental Restoration Chemistry Laboratory.
GEL = General Engineering Laboratories Inc.
HE = High explosive(s).
QA = Quality assurance.
QC = Quality control.
RCRA = Resource Conservation and Recovery Act.
RPSD = Radiation Protection Sample Diagnostics.
SVOC = Semivolatile organic compound.
VOC = Volatile organic compound.
– = No samples.

analyses characterized any potential contaminants at the site. The analytes and methods listed in Tables 2 and 3 are appropriate to characterize the COCs and any potential degradation products at SWMU 2.

III.3 Rate of Contaminant Migration

SWMU 2 is an inactive landfill that was excavated and will contain only minor amounts of subsurface COCs once it has been backfilled with the previously excavated soil and covered with a 5-foot layer of clean fill. The rate of COC migration from subsurface soil is therefore predominantly dependent on infiltrating precipitation, as described in Section V. Data available from the SNL/NM Tijeras Arroyo Groundwater Investigation; numerous SNL/NM monitoring programs for air, water, and radionuclides; various biological surveys; and meteorological monitoring are adequate to characterize the rate of COC migration at SWMU 2.

III.4 Extent of Contamination

Samples of the soil excavated during pit and landfill excavation were collected. Confirmatory soil samples were collected from the base of nine isolated burial pits and from the floor and sidewalls of the landfill excavation. Excavated soil samples were collected to assess whether contaminants had been released into the surrounding soil, and the confirmatory samples were collected to verify the adequacy of the VCM. The samples were collected using the sampling frequency or density shown in Table 1.

Confirmatory soil samples were collected from undisturbed soil at the base of the excavation. The base of the excavation was considered to be the base or sidewall of the pits or landfill. Sampling at more extensive depths was not required because the sample results show no significant contamination. Furthermore, the vertical rate of contamination migration is expected to be extremely low for SWMU 2 because of the low precipitation, high evapotranspiration, and the relatively low solubility of the COCs. Therefore, the excavated soil and confirmatory soil samples are considered representative of the soil potentially contaminated with the COCs and sufficient to determine the suitability of the excavated soil for use as backfill.

In summary, the sampling for the excavations and confirmatory sampling was appropriate and adequate to determine the nature, migration rate, and extent of residual COCs in soil at SWMU 2.

IV. Comparison of COCs to Background Screening Levels

Site history and characterization activities are used to identify potential COCs. The SWMU 2 NFA proposal describes the identification of COCs and the sampling that was conducted to determine the concentration levels of those COCs across the site. Generally, COCs that were evaluated in this risk assessment included all detected organics and all reported inorganic and radiological COCs. If the detection limit of an organic compound was too high (i.e., could possibly cause an adverse effect to human health or the environment), the compound was retained. Nondetect organics not included in this assessment were determined to have sufficiently low detection limits to ensure protection of human health and the environment. In order to provide conservatism in this risk assessment, the calculation used only the maximum concentration value of each COC found for the entire site. The SNL/NM maximum background concentration (Dinwiddie September 1997) was selected to provide the background screening values listed in Tables 4 and 5. Human health nonradiological COCs were also compared to SNL/NM proposed Subpart S action levels, as appropriate (IT July 1994).

Nonradiological inorganics that are essential nutrients, such as iron, magnesium, calcium, potassium, and sodium, were not included in this risk assessment (EPA 1989). Both radiological and nonradiological COCs were evaluated. The nonradiological COCs evaluated included both inorganics and organic compounds. Because COCs at this site will be covered with a 1.5-meter- (approximately 5-foot-) layer of clean fill, they are considered below the limit of biological contact. Therefore, no ecological exposure pathways are considered to exist for these COCs.

Table 4 lists nonradiological COCs for the human health risk assessment at SWMU 2. Table 5 lists radiological COCs for the human health risk assessment. All tables show the associated SNL/NM maximum background concentration values (Dinwiddie September 1997).
Section VI.4 provides a discussion of Tables 4 and 5.

V. Fate and Transport

The primary releases of COCs at SWMU 2 were to the subsurface soil resulting from buried materials. Subsequent excavation of this site and reburial of excavated soil has resulted in COCs being confined to the subsurface soil with a 1.5-meter-layer of clean fill above. Therefore, the COCs in the soil are not exposed to surficial transport mechanisms of wind, surface water, and biota at this site.

Water at SWMU 2 is received as precipitation (rain and occasionally snow). Approximately 8.1 inches of precipitation is received annually. Precipitation will either evaporate at or near the point of contact, infiltrate into the soil, or form runoff. Infiltration at the site is enhanced by the sandy nature of the soil (the soil in the area of the site is primarily Wink fine sandy [USDA June 1977]) and the generally flat terrain, which will limit the extent of lateral transport of soil particles by runoff. However, because contaminated material at this site will be reburied and capped with clean fill, the COCs in soil will not be exposed to surface-water runoff.

Water that infiltrates into the soil will continue to percolate through the soil until field capacity is reached. The effective rooting depths of the natural (undisturbed) soil at SWMU 2 is about 60 inches (USDA June 1977). This indicates the depth of the system's transient water cycling zone (the dynamic balance between percolation/infiltration and evapotranspiration). Because soil that potentially contain COCs was buried more than 1.5 meters (approximately 59 inches) deep, it is unlikely that the buried COCs will be exposed to water percolating from the surface. As noted in Section I, it is estimated that approximately 95 to 99 percent of the annual precipitation is lost to evapotranspiration in this area. Because groundwater at this site is in excess of 260 feet bgs, the potential for COCs to reach groundwater through the unsaturated zone above the water table is extremely small.

Table 4
Nonradiological COCs for Human Health Risk Assessment at SWMU 2 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

COC Name	Maximum Concentration (mg/kg)	SNL/NM Background Concentration (mg/kg)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Log K_{ow} (for organic COCs)	Bioaccumulator?[b] (BCF>40, log K_{ow}>4)
Arsenic	8.3	4.4	**No**	44[c]	NA	**Yes**
Barium	8,100	200	**No**	170[d]	NA	**Yes**
Beryllium	4.2	0.80	**No**	19[c]	NA	No
Cadmium	740	<1	**No**	64[c]	NA	**Yes**
Chromium, total	460	12.8	**No**	16[c]	NA	No
Lead	620	11.2	**No**	49[c]	NA	**Yes**
Mercury	180	<0.1	**No**	5,500[c]	NA	**Yes**
Nickel	400	25.4	**No**	47[c]	NA	**Yes**
Selenium	250	<1	**No**	800[e]	NA	**Yes**
Silver	110	<1	**No**	0.5[c]	NA	No
Uranium	4.5	2.3	**No**	20[d]	NA	No
Acetone	0.019	NA	**NA**	0.69[f]	-0.24[f]	No
Bis (2-ethylhexyl) phthalate	0.207 J	NA	**NA**	851[g]	7.6[i]	**Yes**
Ethylbenzene	0.0043 J	NA	**NA**	15.5[g]	3.15[g]	No
2-Hexanone	0.014 J	NA	**NA**	6[h]	1.38[h]	No
Methylene chloride	0.0073	NA	**NA**	5[i]	1.25[f]	No
Toluene	0.001 J	NA	**NA**	10.7[c]	2.69[c]	No
o-Xylene	0.014	NA	**NA**	23.4[f]	1.5[i]	No
p-,m-Xylenes	0.021	NA	**NA**	23.4[f]	1.5[i]	No

Refer to footnotes at end of table.

Table 4 (Concluded)
Nonradiological COCs for Human Health Risk Assessment at SWMU 2 with Comparison to the Associated SNL/NM Background Screening Value, BCF, and Log K_{ow}

Note: **Bold** indicates the COCs that failed the background screening procedure and/or are bioaccumulators.
[a]From Dinwiddie (September 1997) North Super Group.
[b]NMED (March 1998).
[c]Yanicak (March 1997).
[d]Neumann (1976).
[e]Callahan et al. (1979).
[f]Howard (1990).
[g]Howard (1989).
[h]Howard (1993).
[i]Micromedex (1998).

BCF = Bioconcentration factor.
COC = Constituent of concern.
J = Estimated concentration.
K_{ow} = Octanol-water partition coefficient.
Log = Logarithm (base 10).
mg/kg = Milligram(s) per kilogram.
NA = Not applicable.
NMED = New Mexico Environment Department.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

Table 5
Radiological COCs for Human Health Risk Assessment at SWMU 2 with Comparison to the Associated SNL/NM Background Screening Value and BCF

COC Name	Maximum Concentration (pCi/g)	SNL/NM Background Concentration (pCi/g)[a]	Is Maximum COC Concentration Less Than or Equal to the Applicable SNL/NM Background Screening Value?	BCF (maximum aquatic)	Is COC a Bioaccumulator?[b] (BCF >40)
H-3	85.9	0.021[c]	**No**	NA	No[d]
Th-232	3.58	1.54	**No**	3000[e]	No[d]
U-235	3.28	0.18	**No**	900[e]	**Yes**
U-238	208	1.3	**No**	900[e]	**Yes**
Cs-137	0.247	0.084	**No**	3000[f]	**Yes**[f]

Note: **Bold** indicates COCs that exceed background screening values and/or are bioaccumulators.
[a]From Dinwiddie (September 1997), North Super Group.
[b]NMED (March 1998).
[c]Tharp (1999).
[d]Yanicak (March 1997).
[e]Baker and Soldat (1992).
[f]Whicker and Schultz (1982).

BCF = Bioconcentration factor.
COC = Constituent of concern.
NA = Not applicable.
NMED = New Mexico Environment Department.
pCi/g = Picocurie(s) per gram.
SNL/NM = Sandia National Laboratories/New Mexico.
SWMU = Solid Waste Management Unit.

COCs can enter the food chain through uptake by plant roots. COCs taken up by plant roots can be transported to aboveground tissues where they may be consumed by herbivores, which may, in turn, be eaten by predators. Once in the food web, COCs can be transported from the site by the movements of the organisms that contain them or other surficial transport mechanisms. However, because the soils at SWMU 2 that potentially contain COCs will be buried deeper than the effective rooting depth of 60 inches, food chain transport is expected to be negligible at this site.

The COCs at SWMU 2 include both organic and inorganic constituents. The inorganic COCs (including radionuclides) are elemental in form and are not considered to be degradable, although radiological COCs will undergo decay to stable isotopes or radioactive daughter elements. Other possible transformations of inorganics could include changes in valence (oxidation/reduction reactions) or incorporation into organic forms (e.g., the conversion of selenite or selenate from soil to seleno-amino acids in plants). However, because of the long half lives of the radionuclides, the aridity of the environment at this site, and the lack of potential contact with biota, none of these mechanisms are expected to result in significant losses or transformations of inorganic COCs. Organic compounds may be degraded through photolysis, hydrolysis, and biotransformation. Photolysis requires light, and therefore takes place in the air, at the ground surface, or in surface water. Hydrolysis includes chemical transformations in water, and may occur in the soil solution. Biotransformation is the transformation of chemicals due to plants, animals, and microorganisms. Because these COCs are limited to subsurface soil, photolysis is unlikely to occur, although some hydrolysis and biotransformation may occur if the soil becomes moist. The prevalence of these mechanisms of COC loss, however, is lessened by the aridity of the environment at this site. Although the organic COCs at this site are volatile, the subsurface location of the COCs will prevent significant loss through volatilization.

Table 6 summarizes the fate and transport processes that can occur at SWMU 2. COCs at this site include both inorganics (including radionuclides) and organics. Because the potentially contaminated soil at this has been buried with an overlying cover of clean fill, there is no potential for transport of COCs by wind or surface-water runoff. Because of the depth of the cover layer, the potential for uptake into the food chain is low. Significant leaching in the subsurface soil is unlikely and leaching to the groundwater at this site is highly unlikely. The potential for transformation is low and loss through decay of radiological COCs is insignificant because of their long half lives.

Table 6
Summary of Fate and Transport at SWMU 2

Transport and Fate Mechanism	Existence at Site	Significance
Wind	Yes	None
Surface runoff	Yes	None
Migration to groundwater	No	None
Food chain uptake	Yes	Low
Transformation/degradation	Yes	Low

SWMU = Solid Waste Management Unit.

VI. Human Health Risk Screening Assessment

VI.1 Introduction

Human health risk screening assessment of this site includes a number of steps that culminate in a quantitative evaluation of the potential adverse human health effects caused by constituents located at the site. The steps include the following:

Step 1.	Site data are described that provide information on the potential COCs, as well as the relevant physical characteristics and properties of the site.
Step 2.	Potential pathways are identified by which a representative population might be exposed to the COCs.
Step 3.	The potential intake of these COCs by the representative population is calculated using a tiered approach. The first component of the tiered approach includes two screening procedures. One screening procedure compares the maximum concentration of the COC to an SNL/NM maximum background screening value. COCs that are not eliminated during the first screening procedure are subjected to a second screening procedure, if applicable, that compares the maximum concentration of the COC to the SNL/NM proposed Subpart S action level.
Step 4.	Toxicological parameters are identified and referenced for COCs that were not eliminated during the screening steps.
Step 5.	Potential toxicity effects (specified as a hazard index [HI]) and estimated excess cancer risks are calculated for nonradiological COCs and background. For radiological COCs, the incremental total effective dose equivalent (TEDE) and incremental estimated cancer risk are calculated by subtracting applicable background concentrations directly from maximum on-site contaminant values. This background subtraction only occurs when a radiological COC occurs as contamination and exists as a natural background radionuclide.
Step 6.	These values are compared with guidelines established by the U.S. Environmental Protection Agency (EPA) and the DOE to determine whether further evaluation, and potential site cleanup, is required. Nonradiological COC risk values are also compared to background risk so that an incremental risk can be calculated.
Step 7.	Uncertainties of the above steps are also addressed.

VI.2 Step 1. Site Data

Section I provides the description and history for SWMU 2. Section II presents a comparison of results to DQOs. Section III discusses the nature, rate, and extent of contamination.

VI.3 Step 2. Pathway Identification

SWMU 2 has been designated a future land-use scenario of industrial (DOE et al. September 1995) (see Appendix 1 for default exposure pathways and parameters). Because of the location and the characteristics of the potential contaminants, the primary pathway for human exposure is considered to be soil ingestion for the nonradiological COCs and direct gamma exposure for the radiological COCs. The inhalation pathway for both nonradiological and radiological COCs is included because the potential exists to inhale dust and volatiles. Soil ingestion is included for the radiological COCs as well. No water pathways to the groundwater are considered. Depth to groundwater at SWMU 2 is in excess of 260 feet bgs. Because of the lack of surface water or other significant mechanisms for dermal contact, the dermal exposure pathway is not considered significant. No intake routes through plant, meat, or milk ingestion are considered appropriate for the industrial land-use scenario. However, plant uptake is considered for the residential land-use scenario.

Pathway Identification

Nonradiological Constituents	Radiological Constituents
Soil ingestion	Soil ingestion
Inhalation (dust and volatiles)	Inhalation (dust and volatiles)
Plant uptake (residential only)	Plant uptake (residential only)
	Direct gamma

VI.4 Step 3. COC Screening Procedures

Step 3 is discussed in this section and the two screening procedures. The first compares the maximum COC concentration to the background screening level. The second compares maximum COC concentrations to SNL/NM proposed Subpart S action levels. This second procedure was applied only to COCs that were not eliminated during the first screening procedure.

VI.4.1 Background Screening Procedure

VI.4.1.1 Methodology

Maximum concentrations of nonradiological COCs were compared to the approved SNL/NM maximum screening level for this area. The SNL/NM maximum background concentration was selected to provide the background screening values in Table 4 and was used to calculate risk attributable to background in Section VI.6.2. Only the COCs that were detected above their respective SNL/NM maximum background screening levels or did not have either a quantifiable or a calculated background screening level were considered in further risk assessment analyses.

For radiological COCs that exceeded the SNL/NM background screening levels, background values were subtracted from the individual maximum radionuclide concentrations. Those that did not exceed these background levels were not carried any further in the risk assessment. This approach is consistent with DOE Order 5400.5, "Radiation Protection of the Public and the Environment" (DOE 1993). Radiological COCs that did not have a background value and were detected above the analytical minimum detectable activity were carried through the risk assessment at their maximum levels. The resultant radiological COCs remaining after this step are referred to as background-adjusted radiological COCs.

VI.4.1.2 Results

Tables 4 and 5 show SWMU 2 maximum COC concentrations that were compared to the SNL/NM maximum background values (Dinwiddie September 1997) for the human health risk assessment. For the nonradiological COCs, 11 constituents were measured at concentrations greater than their respective background screening value. Eight nonradiological COCs were organic compounds and did not have corresponding background screening values.

The maximum concentration value for lead was 620 milligrams (mg)/kilogram (kg). The EPA intentionally does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. The NMED guidance for lead screening concentrations for construction and industrial land use scenarios are 750 and 1500 mg/kg, respectively (NMED March 2000). The EPA screening guidance value for a residential land use scenario is 400 mg/kg (EPA July 1994). The maximum lead concentration at this site was less than the NMED industrial screening value. Using the maximum lead concentration, the residential screening level was exceeded. However, since the site was adequately characterized, average concentrations were more representative of actual site conditions. The 95% upper confidence limit of the mean lead concentration was 25.1 mg/kg, which was below the residential land use screening level. Thus, lead was eliminated from further consideration in the human health risk assessment.

For the radiological COCs, five constituents had measured activity concentrations slightly greater than their respective backgrounds (H-3, U-238, U-235, Cs-137, and Th-232).

VI.4.2 Subpart S Screening Procedure

VI.4.2.1 Methodology

The maximum concentrations of nonradiological COCs not eliminated during the background screening process were compared with action levels (IT July 1994) calculated using methods and equations promulgated in the proposed Resource Conservation and Recovery Act Subpart S (EPA 1990) and Risk Assessment Guidance for Superfund (RAGS) (EPA 1989) documentation. Accordingly, all calculations were based upon the assumption that receptor doses from both toxic and potentially carcinogenic compounds result most significantly from ingestion of contaminated soil. Because the samples were all taken from the surface and near surface, this assumption is considered valid. If there were 10 or fewer COCs and each had a maximum concentration of less than 1/10 the action level, the site was judged to pose no significant health hazard to humans. If there were more than 10 COCs, the Subpart S screening procedure was not performed.

VI.4.2.2 Results

Because the SWMU 2 sample set had more than 10 COCs that continued beyond the first screening level (including COCs that did not have background screening values), the proposed Subpart S screening process was not performed. All COCs that were not eliminated during the background screening process for SWMU 2 had a calculated hazard quotient (HQ) and excess cancer risk value.

Radiological COCs have no predetermined action levels analogous to proposed Subpart S levels; therefore, this step in the screening process was not performed for radiological COCs.

VI.5 Step 4. Identification of Toxicological Parameters

Tables 7 (nonradiological) and 8 (radiological) list the COCs retained in the risk assessment and the values for the available toxicological information. The toxicological values used for the COCs in Table 6 were from the Integrated Risk Information System (IRIS) (EPA 1998), the Health Effects Assessment Summary Tables (HEAST) (EPA 1997a), and the EPA Region 3 (EPA 1997b) and EPA Region 9 (EPA 1996) electronic databases. Dose conversion factors (DCFs) used in determining the excess TEDE values for radiological COCs for the individual pathways were the default values provided in the RESRAD computer code (Yu et al. 1993a) as developed in the following documents:

- DCFs for ingestion and inhalation were taken from "Federal Guidance Report No. 11, Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion" (EPA 1988).

- DCFs for surface contamination (contamination on the surface of the site) were taken from DOE/EH-0070, "External Dose-Rate Conversion Factors for Calculation of Dose to the Public" (DOE 1988).

- DCFs for volume contamination (exposure to contamination deeper than the immediate surface of the site) were calculated using the methods discussed in "Dose-Rate Conversion Factors for External Exposure to Photon Emitters in Soil" (Kocher 1983) and in ANL/EAIS-8, *Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil* (Yu et al. 1993b).

VI.6 Step 5. Exposure Assessment and Risk Characterization

Section VI.6.1 describes the exposure assessment for this risk assessment. Section VI.6.2 provides the risk characterization, including the HI and the excess cancer risk for both the potential nonradiological COCs and associated background for industrial and residential land uses. The incremental TEDE and incremental estimated cancer risk are provided for the background-adjusted radiological COCs for both industrial and residential land uses.

VI.6.1 Exposure Assessment

Appendix 1 shows the equations and parameter input values used to calculate intake values and subsequent HI and excess cancer risk values for the individual exposure pathways. The appendix shows parameters for both industrial and residential land-use scenarios. The equations for nonradiological COCs are based upon the RAGS (EPA 1989). Parameters are based upon information from the RAGS (EPA 1989) and other EPA guidance documents and reflect the reasonable maximum exposure (RME) approach advocated by the RAGS (EPA 1989). For radiological COCs, the coded equations provided in RESRAD computer code are used to estimate the incremental TEDE and cancer risk for individual exposure pathways. Further discussion of this process is provided in the *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD* (Yu et al. 1993a).

Table 7
Toxicological Parameter Values for SWMU 2 Nonradiological COCs

COC Name	RfD_o (mg/kg-d)	Confidence[a]	RfD_{inh} (mg/kg-d)	Confidence[a]	SF_o $(mg/kg\text{-}day)^{-1}$	SF_{inh} $(mg/kg\text{-}day)^{-1}$	Cancer Class[b]
Arsenic	3.0E-4[c]	M	–	–	1.5E+0[c]	1.5E+1[c]	A
Barium	7.0E-2[c]	M	1.4E-4[d]	–	–	–	–
Beryllium	2.0E-3[c]	L to M	5.7E-6[c]	M	–	8.4E+0[c]	B1
Cadmium	5.0E-4[c]	H	5.7E-5[d]	–	–	6.3E+0[c]	B1
Chromium III	1.0E+0[c]	L	5.7E-7[e]	–	–	–	–
Chromium VI	5.0E-3[c]	L	–	–	–	4.2E+1[c]	A
Mercury	3.0E-4[f]	–	8.6E-5[c]	M	–	–	D
Nickel	2.0E-2[c]	M	–	–	–	–	–
Selenium	5.0E-3[c]	H	–	–	–	–	D
Silver	5.0E-3[c]	L	–	–	–	–	D
Uranium	3E-3[c]	M	–	–	–	–	–
Acetone	1.0E-1[c]	L	1.0E-1[d]	–	–	–	D
Bis (2-ethylhexyl) phthalate	2.0E-2[d]	–	2.2E-2[d]	–	1.4E-2[d]	1.4E-2[d]	–
Ethylbenzene	1.0E-1[c]	L	2.9E-1[c]	L	–	–	D
2-Hexanone	4.0E-2[f]	–	–	–	–	–	–
Methylene chloride	6.0E-2[c]	M	8.6E-1[f]	–	7.5E-3[c]	1.7E-3[c]	B2
Toluene	2.0E-1[c]	M	1.1E-1[c]	M	–	–	D
o-Xylene	2.0E+0[f]	–	2.0E-1[d]	–	–	–	–
p-,m-Xylenes	2.0E+0[f]	–	2.0E-1[d]	–	–	–	–

[a]Confidence associated with IRIS (EPA 1998) database values. Confidence: L = low, M = medium, H = high.
[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989) taken from IRIS (EPA 1998):

A = Human carcinogen.
B1 = Probable human carcinogen. Limited human data are available.
B2 = Probable human carcinogen. Sufficient evidence in animals and inadequate or no evidence in humans.
D = Not classifiable as to human carcinogenicity.

[c]Toxicological parameter values from IRIS electronic database (EPA 1998a).
[d]Toxicological parameter values from EPA Region 9 electronic database (EPA 1996).
[e]Toxicological parameter values from EPA Region 3 electronic database (EPA 1997b).
[f]Toxicological parameter values from HEAST database (EPA 1997a).

COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
HEAST = Health Effects Assessment Summary Tables.
IRIS = Integrated Risk Information System.
mg/kg-d = Milligram(s) per kilogram day.
$(mg/kg\text{-}day)^{-1}$ = Per milligram per kilogram day.
RfD_{inh} = Inhalation chronic reference dose.
RfD_o = Oral chronic reference dose.
SF_{inh} = Inhalation slope factor.
SF_o = Oral slope factor.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table 8
Radiological Toxicological Parameter Values for SWMU 2 COCs Obtained from RESRAD Risk Coefficients[a]

COC Name	SF_o (1/pCi)	SF_{inh} (1/pCi)	SF_{ev} (g/pCi-yr)	Cancer Class[b]
H-3	7.2E-14	9.6E-14	0	A
U-238	6.20E-11	1.20E-08	6.60E-08	A
U-235	4.70E-11	1.30E-08	2.70E-07	A
Th-232	3.30E-11	1.90E-08	2.00E-11	A
Cs-137	3.20E-11	1.90E-11	2.10E-06	A

[a]From Yu et al. (1993a).
[b]EPA weight-of-evidence classification system for carcinogenicity (EPA 1989): A = Human carcinogen for high dose and high dose rate (i.e., greater than 50 rem per year). For low-level environmental exposures, the carcinogenic effect has not been observed and documented.
1/pCi = One per picocurie.
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
g/pCi-yr = Gram(s) per picocurie-year.
SF_{ev} = External volume exposure slope factor.
SF_{inh} = Inhalation slope factor.
SF_o = Oral (ingestion) slope factor.
SWMU = Solid Waste Management Unit.

Although the designated land-use scenario is industrial for this site, risk and TEDE values for a residential land-use scenario are also presented. These residential risk and TEDE values are presented only to provide perspective of potential risk to human health under the more restrictive land-use scenario.

VI.6.2 Risk Characterization

Table 9 shows a HI of 2 for the SWMU 2 nonradiological COCs and an estimated excess cancer risk of 5E-6 for the designated industrial land-use scenario. The numbers presented included exposure from soil ingestion and dust and volatile inhalation for nonradiological COCs. Table 10 shows an HI of 0.01 and an excess cancer risk of 2E-6 assuming the maximum background concentrations of the SWMU 2 associated background constituents for the designated industrial land-use scenario.

For the radiological COCs, contribution from the direct gamma exposure pathway is included. For the industrial land-use scenario, a TEDE was calculated for an individual on the site which resulted in an incremental TEDE of 1.9E-2 millirems (mrem) per year (yr). In accordance with EPA guidance found in Office of Solid Waste and Emergency Response Directive No. 9200.4-18 (EPA 1997c), an incremental TEDE of 15 mrem/yr is used for the probable land-use scenario (industrial in this case); the calculated dose value for SWMU 2 for the industrial land-use scenario is well below this guideline. The estimated excess cancer risk is 3.9E-7.

Table 9
Risk Assessment Values for SWMU 2 Nonradiological COCs

COC Name	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	8.3	0.03	4E-6	0.47	9E-5
Barium	8100	0.12	–	1.21	–
Beryllium	4.2	0.00	2E-9	0.01	3E-9
Cadmium	740	1.45	3E-7	604.92	4E-7
Chromium, total	460	0.09	1E-6	0.37	2E-6
Mercury	180	0.59	–	310.05	–
Nickel	400	0.02	–	0.59	–
Selenium	250	0.05	–	87.95	–
Silver	110	0.02	–	4.54	–
Uranium	4.5	0.00	–	0.01	–
Acetone	0.019	0.00	–	0.00	–
Bis (2-ethylhexyl) phthalate	0.207 J	0.00	1E-9	0.00	7E-9
Ethylbenzene	0.0043 J	0.00	–	0.00	–
2-Hexanone	0.014 J	0.00	–	0.00	–
Methylene chloride	0.0073	0.00	5E-10	0.00	6E-8
Toluene	0.001 J	0.00	–	0.00	–
o-Xylene	0.014	0.00	–	0.00	–
p,m-Xylenes	0.021	0.00	–	0.00	–
Total		**2**	**5E-6**	**1010**	**9E-5**

[a]From EPA (1989).
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
J = Estimated value.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

Table 10
Risk Assessment Values for SWMU 2 Nonradiological Background Constituents

COC Name	Background Concentration[a] (mg/kg)	Industrial Land-Use Scenario[b]		Residential Land-Use Scenario[b]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	4.4	0.01	2E-6	0.25	5E-5
Barium	200	0.00	–	0.03	–
Beryllium	0.80	0.00	4E-10	0.00	6E-10
Cadmium	<1	–	–	–	–
Chromium, total	12.8	0.00	–	0.00	–
Mercury	<0.1	–	–	–	–
Nickel	25.4	0.00	–	0.04	–
Selenium	<1	–	–	–	–
Silver	<1	–	–	–	–
Uranium	2.3	0.00	–	0.01	–
Total		**0.01**	**2E-6**	**0.3**	**5E-5**

[a]From Dinwiddie (September 1997), North Super Group.
[b]From EPA (1989).
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.
– = Information not available.

For the residential land-use scenario nonradioactive COCs, the HI is 1010 and the estimated excess cancer risk is 9E-5 (Table 9). The numbers in the table included exposure from soil ingestion, dust and volatile inhalation, and plant uptake. Although the EPA (1991) generally recommends that inhalation not be included in a residential land-use scenario, this pathway is included because of the potential for soil in Albuquerque, New Mexico, to be eroded and, subsequently, for dust to be present in predominantly residential areas. Because of the nature of the local soil, other exposure pathways are not considered (see Appendix 1). Table 10 shows that for the SWMU 2 associated background constituents, the HI is 0.3 and the estimated excess cancer risk is 5E-5.

For the radiological COCs, the incremental TEDE for the residential land-use scenario is 2.8E-7 mrem/yr. The guideline being used is an excess TEDE of 75 mrem/yr (SNL/NM February 1998) for a complete loss of institutional controls (residential land use in this case); the calculated dose value for SWMU 2 for the residential land-use scenario is well below this guideline. Consequently, SWMU 2 is eligible for unrestricted radiological release as the residential land-use scenario resulted in an incremental TEDE of less than 75 mrem/yr to the on-site receptor. The estimated excess cancer risk is 5.1E-12. The excess cancer risk from the nonradiological COCs and the radiological COCs is not additive, as noted in the RAGS (EPA 1989).

VI.7 Step 6. Comparison of Risk Values to Numerical Guidelines.

The human health risk assessment analysis evaluated the potential for adverse health effects for both the industrial land-use scenario (the designated land-use scenario for this site) and the residential land-use scenario.

For the industrial land-use scenario nonradiological COCs, the HI was 2 (greater than the numerical guideline of 1 suggested in the RAGS [EPA 1989]). The estimated excess cancer risk was 5E-6. New Mexico Environment Department (NMED) Guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (NMED March 2000); thus, the excess cancer risk for this site was below the suggested acceptable risk value. This assessment also determined risks considering background concentrations of the potential nonradiological COCs for both the industrial and the residential land-use scenarios. Assuming the industrial land-use scenario, for nonradiological COCs the HI was 0.01 and the estimated excess cancer risk was 2E-6. Incremental risk is determined by subtracting risk associated with background concentrations from potential COC risk. These numbers are not rounded before the difference is determined and, therefore, may appear to be inconsistent with numbers presented in tables and within the text. For conservatism, the background constituents that do not have quantified background concentrations are assumed to have a HQ of 0.00. Incremental HI is 2.36 and the estimated incremental cancer risk is 3.30E-6 for the industrial land-use scenario. The incremental HI is above the NMED guideline for considering an industrial land-use scenario.

For radiological COCs of the industrial land-use scenario, incremental TEDE is 1.9E-2 mrem/yr, which is significantly less than EPA's numerical guideline of 15 mrem/yr. Incremental estimated excess cancer risk is 3.9E-7.

The calculated HI for the residential land-use scenario nonradiological COCs is 1010, which is above the numerical guidance. The estimated excess cancer risk was calculated to be 9E-5. NMED Guidance states that cumulative excess lifetime cancer risk must be less than 1E-5 (NMED March 2000); thus, the excess cancer risk for this site is above the suggested acceptable risk value. The HI for associated background for the residential land-use scenario is 0.3; the estimated excess cancer risk was 5E-5. The incremental HI is 1009.79 and the estimated incremental cancer risk was 4.25E-5 for the residential land-use scenario. The incremental HI and excess cancer risk were above the NMED guidelines considering a residential land-use scenario.

The incremental TEDE for a residential land-use scenario from the radiological components is 2.8E-7 mrem/yr, which is significantly less than the numerical guideline of 75 mrem/yr suggested in the SNL/NM RESRAD Input Parameter Assumptions and Justification (SNL/NM February 1998). The estimated excess cancer risk is 5.1E-12.

VI.8 Step 7. Uncertainty Discussion

The determination of the nature, rate, and extent of contamination at SWMU 2 was based upon an initial conceptual model that was validated with excavated soil sampling and confirmatory sampling conducted at the completion of the VCM. The VCM sampling was implemented in accordance with the VCM plan for SWMU 2. The DQOs contained in the VCM plan are appropriate for use in risk-screening assessments. The data collected, based upon sample location, density, and depth, are representative of the site and soil planned for excavation backfill. The analytical requirements and results satisfy the DQOs. Data quality was verified/validated in accordance with SNL/NM procedures (SNL/NM December 1999 and SNL/NM July 1996). Therefore, there is no uncertainty associated with the data quality used to perform the risk screening assessment at SWMU 2.

Because of the location, history of the site, and future land use (DOE et al. September 1995), there is low uncertainty in the land-use scenario and the potentially affected populations that were considered in performing the risk assessment analysis. Because the COCs are found in surface and in near-surface soils and because of the location and physical characteristics of the site, there is little uncertainty in the exposure pathways relevant to the analysis.

An RME approach was used to calculate the risk assessment values. This means that the parameter values in the calculations are conservative and that calculated intakes are probably overestimates. Maximum measured values of COC concentrations are used to provide conservative results.

Table 7 shows the uncertainties (confidence) in nonradiological toxicological parameter values. There is a mixture of estimated values and values from the IRIS (EPA 1998), the HEAST (EPA 1997a), EPA Region 3 (EPA 1997b), and EPA Region 9 (EPA 1996) electronic databases. Where values are not provided, information is not available from the HEAST (EPA 1997a), IRIS (EPA 1998), or the EPA regions (EPA 1996, 1997b). Because of the conservative nature of the RME approach, uncertainties in toxicological values are not expected to change the conclusion from the risk assessment analysis.

Total and incremental estimated excess cancer risk values for the COCs were below the NMED guideline for the industrial land-use scenario. Although the total and incremental HIs were above the NMED guideline, the HI was conservatively estimated through the use of maximum concentrations of the detected COCs. Because the site was adequately characterized, average concentrations were more representative of actual site conditions. When the upper 95% confidence limit of the mean concentration for cadmium (18.5 mg/kg) and mercury (2.7 mg/kg) were used in place of their respective maximum concentrations, the total and incremental HIs were reduced to 0.4 and 0.37, respectively. Both values were within NMED guidelines considering an industrial land-use scenario.

For radiological COCs, the conclusion of the risk assessment is that potential effects on human health for both industrial and residential land-use scenarios are within guidelines and are a small fraction of the estimated 360 mrem/yr received by the average U.S. population (NCRP 1987).

The overall uncertainty in all of the steps in the risk assessment process is not considered significant with respect to the conclusion reached.

VI.9 Summary

SWMU 2 has identified COCs consisting of some inorganic, organic, and radiological compounds. Because of the location of the site, the designated industrial land-use scenario, and the nature of contamination, potential exposure pathways identified for this site included soil ingestion and dust and volatile inhalation for chemical COCs and soil ingestion, dust inhalation, and direct gamma exposure for radionuclides. Plant uptake was included as an exposure pathway for the residential land-use scenario.

Using conservative assumptions and an RME approach to risk assessment, calculations for nonradiological COCs show that for the industrial land-use scenario, the HI (2) is above the accepted numerical guidance from the EPA. Excess cancer risk was estimated to be 5E-6. Thus excess cancer risk was below the acceptable risk value provided by the NMED for a industrial land-use scenario (NMED March 1998). The incremental HI is 2.36, and the incremental excess cancer risk was 3.30E-6 for the industrial land-use scenario. The incremental HI was above the NMED guideline for the industrial land-use scenario.

Although the total and incremental HIs were above the NMED guideline, the HI was conservatively estimated through the use of maximum concentrations of the detected COCs. Because the site was adequately characterized, average concentrations were more representative of actual site conditions. When the upper 95% confidence limit of the mean concentration for cadmium (18.5 mg/kg) and mercury (2.7 mg/kg) was used in place of their respective maximum concentrations, the total and incremental HIs were reduced to 0.4 and 0.37, respectively. Both values were within proposed guidelines considering an industrial land-use scenario.

Incremental TEDE and corresponding estimated cancer risk from radiological COCs are much lower than EPA guidance values; the estimated TEDE is 1.9E-2 mrem/yr for the industrial land-use scenario. This value is much lower than the EPA's numerical guidance of 15 mrem/yr in EPA guidance (EPA 1997c). The corresponding incremental estimated cancer risk value is 3.9E-7 for the industrial land-use scenario. Furthermore, the incremental TEDE for the residential land-use scenario that results from a complete loss of institutional control is only 2.8E-7 mrem/yr with an associated risk of 5.1E-12. The guideline for this scenario is 75 mrem/yr (SNL/NM February 1998). Therefore, SWMU 2 is eligible for unrestricted radiological release.

Uncertainties associated with the calculations are considered small relative to the conservativeness of risk assessment analysis. It is, therefore, concluded that this site poses insignificant risk to human health under the industrial land-use scenario.

VII. Ecological Risk Screening Assessment

VII.1 Introduction

This section addresses the potential for ecological risks associated with exposure to COCs in soils at SWMU 2. A component of the NMED Risk-Based Decision Tree is to conduct an ecological screening assessment that corresponds with that presented in EPA's Ecological Risk Assessment Guidance for Superfund (EPA 1997d). The current methodology contains an initial scoping assessment that determines the need for a more detailed screening assessment. The initial components of NMED's decision tree (a discussion of DQOs, a data assessment, and evaluations of bioaccumulation and fate-and-transport potential) are addressed in previous sections of this report. This section provides a discussion of whether complete exposure pathways exist at SWMU 2 between the COCs and potential ecological receptors. If it is determined that such pathways exist, the scoping assessment proceeds to a screening assessment, whereby a more quantitative estimate of ecological risk is conducted.

VII.2 Scoping Assessment

The scoping assessment focuses primarily on the likelihood of exposure of biota at/or adjacent to the site to be exposed to constituents associated with site activities. As shown in Tables 4 and 5, COCs are present in the soils at SWMU 2 that exceed SNL/NM background screening values. However, as stated in Section IV, all potentially contaminated soil at this site was reburied and covered with an overlying cap consisting of 1.5 meters (approximately 5 feet) of clean fill. Based upon information provided in IT (July 1998) regarding the limits of biological activity in soils at KAFB, this cap is expected to be of sufficient thickness to preclude contact between the COCs and biota. Therefore, no complete ecological pathways are expected to exist at this site. As a consequence, a screening assessment was not deemed necessary to predict the potential level of ecological risk associated with the site.

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APPENDIX 1
EXPOSURE PATHWAY DISCUSSION FOR CHEMICAL AND RADIONUCLIDE CONTAMINATION

Introduction

Sandia National Laboratories/New Mexico (SNL/NM) proposes that a default set of exposure routes and associated default parameter values be developed for each future land use designation being considered for SNL/NM Environmental Restoration (ER) project sites. This default set of exposure scenarios and parameter values would be invoked for risk assessments unless site-specific information suggested other parameter values. Because many SNL/NM solid waste management units (SWMU) have similar types of contamination and physical settings, SNL/NM believes that the risk assessment analyses at these sites can be similar. A default set of exposure scenarios and parameter values will facilitate the risk assessments and subsequent review.

The default exposure routes and parameter values suggested are those that SNL/NM views as resulting in a Reasonable Maximum Exposure (RME) value. Subject to comments and recommendations by the U.S. Environmental Protection Agency (EPA) Region VI and New Mexico Environment Department (NMED), SNL/NM proposes that these default exposure routes and parameter values be used in future risk assessments.

At SNL/NM, all SWMUs exist within the boundaries of the Kirtland Air Force Base (KAFB). Approximately 157 potential waste and release sites have been identified where hazardous, radiological, or mixed materials may have been released to the environment. Evaluation and characterization activities have occurred at all of these sites to varying degrees. Among other documents, the SNL/NM ER draft Environmental Assessment (DOE 1996) presents a summary of the hydrogeology of the sites, the biological resources present and proposed land use scenarios for the SNL/NM SWMUs. At this time, all SNL/NM SWMUs have been tentatively designated for either industrial or recreational future land use. The NMED has also requested that risk calculations be performed based upon a residential land use scenario. All three land use scenarios will be addressed in this document.

The SNL/NM ER project has screened the potential exposure routes and identified default parameter values to be used for calculating potential intake and subsequent Hazard index (HI), excess cancer risk and dose values. The EPA (EPA 1989a) provides a summary of exposure routes that could potentially be of significance at a specific waste site. These potential exposure routes consist of:

- Ingestion of contaminated drinking water
- Ingestion of contaminated soil
- Ingestion of contaminated fish and shell fish
- Ingestion of contaminated fruits and vegetables

- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming
- Dermal contact with chemicals in water
- Dermal contact with chemicals in soil
- Inhalation of airborne compounds (vapor phase or particulate)
- External exposure to penetrating radiation (immersion in contaminated air; immersion in contaminated water and exposure from ground surfaces with photon-emitting radionuclides).

Based upon the location of the SNL/NM SWMUs and the characteristics of the surface and subsurface at the sites, we have evaluated these potential exposure routes for different land use scenarios to determine which should be considered in risk assessment analyses (the last exposure route is pertinent to radionuclides only). At SNL/NM SWMUs, there does not currently occur any consumption of fish, shell fish, fruits, vegetables, meat, eggs, or dairy products that originate on site. Additionally, no potential for swimming in surface water is present due to the high-desert environmental conditions. As documented in the RESRAD computer code manual (ANL 1993), risks resulting from immersion in contaminated air or water are not significant compared to risks from other radiation exposure routes.

For the industrial and recreational land use scenarios, SNL/NM ER has, therefore, excluded the following four potential exposure routes from further risk assessment evaluations at any SNL/NM SWMU:

- Ingestion of contaminated fish and shell fish
- Ingestion of contaminated fruits and vegetables
- Ingestion of contaminated meat, eggs, and dairy products
- Ingestion of contaminated surface water while swimming.

That part of the exposure pathway for radionuclides related to immersion in contaminated air or water is also eliminated.

For the residential land use scenario, we will include ingestion of contaminated fruits and vegetables because of the potential for residential gardening.

Based upon this evaluation, for future risk assessments, the exposure routes that will be considered are shown in Table 1. Dermal contact is included as a potential exposure pathway in all land use scenarios. However, the potential for dermal exposure to inorganics is not considered significant and will not be included. In general, the dermal exposure pathway is generally considered to not be significant relative to water ingestion and soil ingestion pathways but will be considered for organic components. Because of the lack of toxicological parameter values for this pathway, the inclusion of this exposure pathway into risk assessment calculations may not be possible and may be part of the uncertainty analysis for a site where dermal contact is potentially applicable.

Table 1
Exposure Pathways Considered for Various Land Use Scenarios

Industrial	Recreational	Residential
Ingestion of contaminated drinking water	Ingestion of contaminated drinking water	Ingestion of contaminated drinking water
Ingestion of contaminated soil	Ingestion of contaminated soil	Ingestion of contaminated soil
Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)	Inhalation of airborne compounds (vapor phase or particulate)
Dermal contact	Dermal contact	Dermal contact
External exposure to penetrating radiation from ground surfaces	External exposure to penetrating radiation from ground surfaces	Ingestion of fruits and vegetables
		External exposure to penetrating radiation from ground surfaces

Equations and Default Parameter Values for Identified Exposure Routes

In general, SNL/NM expects that ingestion of compounds in drinking water and soil will be the more significant exposure routes for chemicals; external exposure to radiation may also be significant for radionuclides. All of the above routes will, however, be considered for their appropriate land use scenarios. The general equations for calculating potential intakes via these routes are shown below. The equations are from the Risk Assessment Guidance for Superfund (RAGS): Volume 1 (EPA 1989a, 1991). These general equations also apply to calculating potential intakes for radionuclides. A more in-depth discussion of the equations used in performing radiological pathway analyses with the RESRAD code may be found in the RESRAD Manual (ANL 1993). Also shown are the default values SNL/NM ER suggests for use in RME risk assessment calculations for industrial, recreational, and residential scenarios, based upon EPA and other governmental agency guidance. The pathways and values for chemical contaminants are discussed first, followed by those for radionuclide contaminants. RESRAD input parameters that are left as the default values provided with the code are not discussed. Further information relating to these parameters may be found in the RESRAD Manual (ANL 1993).

Generic Equation for Calculation of Risk Parameter Values

The equation used to calculate the risk parameter values (i.e., hazard quotients/hazard index [HI], excess cancer risk, or radiation total effective dose equivalent [dose]) is similar for all exposure pathways and is given by:

Risk (or Dose) = Intake x Toxicity Effect (either carcinogenic, noncarcinogenic, or radiological)

$$= C \times (CR \times EFD/BW/AT) \times \text{Toxicity Effect} \quad (1)$$

where

C = contaminant concentration (site specific)
CR = contact rate for the exposure pathway
EFD = exposure frequency and duration
BW = body weight of average exposure individual
AT = time over which exposure is averaged.

The total risk/dose (either cancer risk or HI) is the sum of the risks/doses for all of the site-specific exposure pathways and contaminants.

The evaluation of the carcinogenic health hazard produces a quantitative estimate for excess cancer risk resulting from the constituents of concern (COC) present at the site. This estimate is evaluated for determination of further action by comparison of the quantitative estimate with the potentially acceptable risk range of 1E-6 for Class A and B carcinogens and 1E-5 for Class C carcinogens. The evaluation of the noncarcinogenic health hazard produces a quantitative estimate (i.e., the HI) for the toxicity resulting from the COCs present at the site. This estimate is evaluated for determination of further action by comparison of this quantitative estimate with the EPA standard HI of unity (1). The evaluation of the health hazard due to radioactive compounds produces a quantitative estimate of doses resulting from the COCs present at the site.

The specific equations used for the individual exposure pathways can be found in RAGS (EPA 1989a) and the RESRAD Manual (ANL 1993). Table 2 shows the default parameter values suggested for used by SNL/NM at SWMUs, based upon the selected land use scenario. References are given at the end of the table indicating the source for the chosen parameter values. The intention of SNL/NM is to use default values that are consistent with regulatory guidance and consistent with the RME approach. Therefore, the values chosen will, in general, provide a conservative estimate of the actual risk parameter. These parameter values are suggested for use for the various exposure pathways based upon the assumption that a particular site has no unusual characteristics that contradict the default assumptions. For sites for which the assumptions are not valid, the parameter values will be modified and documented.

<u>Summary</u>

SNL/NM proposes the described default exposure routes and parameter values for use in risk assessments at sites that have an industrial, recreational or residential future land use scenario. There are no current residential land use designations at SNL/NM ER sites, but this scenario has been requested to be considered by the NMED. For sites designated as industrial or recreational land use, SNL/NM will provide risk parameter values based upon a residential land use scenario to indicate the effects of data uncertainty on risk value calculations or in order to potentially mitigate the need for institutional controls or restrictions on SNL/NM ER sites. The parameter values are based upon EPA guidance and supplemented by information from other government sources. The values are generally consistent with those proposed by Los Alamos National Laboratory, with a few minor variations. If these exposure routes and parameters are acceptable, SNL/NM will use them in risk assessments for all sites where the assumptions are consistent with site-specific conditions. All deviations will be documented.

Table 2
Default Parameter Values for Various Land Use Scenarios

Parameter	Industrial	Recreational	Residential
General Exposure Parameters			
Exposure frequency	8 hr/day for 250 day	4 hr/wk for 52 wk/yr	350 day/yr
Exposure duration (yr)	25[a,b]	30[a,b]	30[a,b]
Body weight (kg)	70[a,b]	70 adult[a,b] 15 child	70 adult[a,b] 15 child
Averaging Time (days) for carcinogenic compounds (= 70 y x 365 day/yr) for noncarcinogenic compounds (= ED x 365 day/yr)	25,550[a] 9,125	25,550[a] 10,950	25,550[a] 10,950
Soil Ingestion Pathway			
Ingestion rate	100 mg/day[c]	200 mg/day child 100 mg/day adult	200 mg/day child 100 mg/day adult
Inhalation Pathway			
Inhalation rate (m^3/yr)	5,000[a,b]	260[d]	7,000[a,b,d]
Volatilization factor (m^3/kg)	chemical specific	chemical specific	chemical specific
Particulate emission factor (m^3/kg)	1.32E9[a]	1.32E9[a]	1.32E9[a]
Water Ingestion Pathway			
Ingestion rate (liter/day)	2[a,b]	2[a,b]	2[a,b]
Food Ingestion Pathway			
Ingestion rate (kg/yr)	NA	NA	138[b,d]
Fraction ingested	NA	NA	0.25[b,d]
Dermal Pathway			
Surface area in water (m^2)	2[b,e]	2[b,e]	2[b,e]
Surface area in soil (m^2)	0.53[b,e]	0.53[b,e]	0.53[b,e]
Permeability coefficient	chemical specific	chemical specific	chemical specific

[a]Risk Assessment Guidance for Superfund, Vol. 1, Part B (EPA 1991).
[b]Exposure Factors Handbook (EPA 1989b).
[c]EPA Region VI guidance.
[d]For radionuclides, RESRAD (Argonne National Laboratory, 1993. *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD*, Version 5.0, ANL/EAD/LD-2, Argonne National Laboratory, Argonne, IL. 1993) is used for human health risk calculations; default parameters are consistent with RESRAD guidance.
[e]Dermal Exposure Assessment (EPA 1992).
ED = Exposure duration.
EPA = U.S. Environmental Protection Agency.
hr = Hour.
kg = Kilogram(s).
m = Meter(s).
mg = Milligram(s).
NA = Not available.
wk = Week.
yr = Year.

References

ANL, see Argonne National Laboratory.

Argonne National Laboratory (ANL), 1993. *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD*, Version 5.0, ANL/EAD/LD-2, Argonne National Laboratory, Argonne, IL.

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ADDITIONAL /SUPPORTING DATA

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